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FOR
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FRUIT CULTURE FOR PROFIT.

THE object which I have in view in regard to this matter is to popularize fruit culture by creating a general interest in it. That hardy fruit-culture is in a backward state in this country it is impossible to doubt; the state of many orchards loudly proclaims this fact: but all that any one person can hope to do is just to add a little to the general fund of knowledge, to throw a little light here and there on the obscure places, and so help to carry the subject onwards. It is the Vine which has made the peasant farmers in France so prosperous, and if small farms in this or any other country are ever to yield a living profit, fruit-culture must be made to furnish one of the main props. The demand for fruit for our ever-growing town populations is constantly increasing, and it must be borne in mind that, unless we are up and doing, the foreigner, with his greater aptitude for minutiæ in his work, his greater care in small things, will step in and reap the profit. I shall try to say all I want to say as plainly as I can without weighting myself with a single unnecessary word, and for this reason I shall eschew all scientific and technical terms. The title may to some seem rather out of place, inasmuch as I am not treating upon market fruit-growing exclusively; I am trying to take a comprehensive view of the subject, looking into all its details, and I contend that all fruit-culture, whether it be carried out on a small scale for home supply or in a market garden, either is or should be regarded from the standpoint of profit and loss.

THE GOOSEBERRY.

In some of the northern and midland counties, societies have long ago been established for the purpose of encouraging the production of large individual fruits, and through their agency have sprung up those monster berries we occasionally read about in the newspapers. To the amateur growers clustered round the large northern and midland towns the culture of the Gooseberry for exhibition becomes an interesting pursuit, and is the cause of much emulation leading to much thought and study bearing upon the best methods of increasing the size and weight of the fruit. Though we may not always sympathize with a given object, we must admire earnest, steady, persistent effort, even though we fail to see its real utility. I remember a good many years ago visiting an amateur's garden who was famed as a prize-taker at the Gooseberry shows, and the way in which his bushes were trimmed and trained, and the manner in which their wants were supplied, especially in the way of moisture, was most interesting. The fruits were severely thinned, and little dishes of water were placed under the bushes, so that during the warm sunny days a soft and genial atmosphere constantly enveloped the fruit, adding much to their size. Though the production of monster Gooseberries is interesting to those members of Gooseberry societies who are anxious to win a prize, they do not meet a really useful want, and need not be further referred to here. Such kinds as Crown Bob that bear immense crops of berries for gathering green, or the Warrington for making into jam when ripe, are better to grow for profit. Gooseberries are adapted for planting in various positions, but the soil for the main crop must be deep and rich. In poor soil in dry summers the fruit never attains full size or flavour, though, for meeting special wants, positions not generally suitable for producing first-rate fruit may still be profitably utilized. In large towns there is a brisk demand for early green Gooseberries for making tarts, &c., and they are eagerly bought up in the neighbourhood of Exeter and other places on the west coast for the London markets, as a week, or even a very few days in point of earliness, adds immensely to their value. Thus, anybody in possession of a warm, dry, early bank may plant it with Gooseberries for gathering green to obtain them early, in the same way that warm sunny slopes are planted with Strawberries to meet the first demand, and such a crop is often more profitable than if permitted to ripen.

Form of Bush.—The Gooseberry may be trained as pyramids or espaliers, or as palmettes on fences or walls, but the bush form is best, as it involves no expense in training. The bush should stand on a clear straight leg, not much less than 9 in. or 1 ft. long. The head should be made to assume a circular form, with the centre kept open by pruning for the purpose of letting in the air and sunshine, as well as to enable the fruit to be readily gathered; an expert cultivator with a good eye and a sharp knife finds no difficulty in making his bushes assume the desired shape. If we take a cutting of a Gooseberry or Currant bush, say 15 in. long, cut out all the eyes except the three upper ones, cut the base across smoothly beneath a joint, plant its lower 3 in. firmly in the ground, and mulch with short manure or litter, the three eyes or buds left will in nearly every case make three shoots, and at the end of the first year commences the pruner's work of training the bush, and this is done simply by pruning to an eye pointing in the direction we wish the future branch to take.

Thus, it is easy enough to keep the centre of the bush open by cutting to eyes pointing outwards, and a bush that naturally assumes a weeping habit, like the Warrington, may be lifted upwards by cutting to an eye on the upper side of the shoot, whilst those bushes with too erect a tendency, such as the Champagne, may be made to assume a more spreading habit by cutting to an eye situated on the lower side of the branch. It will thus be seen that with bush fruits the form is in the pruner's hands, like clay in the hands of the potter, and may be as easily made into any shape. Of course in the case of pyramids there must be some support for the main stem. A stout stake 5 ft. or 6 ft. high should be driven into the ground, and against this stake the tree should be planted, and its leading shoot tied to it. Though the natural habit of the Gooseberry is not suggestive of a pyramidal outline, yet by training the branches will rise tier above tier, gradually narrowing from its base to the summit, and where land is scarce and the most has to be made of it this is a very good way of growing Gooseberries.

Planting.—They may be planted in beds or quarters by themselves, or they may be utilized as undergrowth with taller fruit trees, such as Apples, Plums, or Pears, to form the top crop. They may also be planted either as dwarf bushes, or trained on espaliers round the margins of the vegetable quarters. In the kitchen garden the former is a common mode of culture, but however and wherever they are planted, the land should be well manured and well cultivated before planting, and they should not be placed too near each other; a space of 6 ft. square is not too much for a well-developed Gooseberry bush to allow the light to play all round it, and give free access for the purpose of gathering the fruit. On the best soils the distance should be increased *rather than* diminished. It is true the bushes will not occupy all the space for two or three years, but other crops of dwarf growth, such as Lettuces, Spinach, &c., may fill up the intervals till the bushes have made some progress. Strawberries are a good crop to plant with young Currant or Gooseberry bushes, as by the time the latter require all the space the former will have done their work. When the bushes are allowed the full space named, at first very young bushes should not be selected, as those five or six years old, if they have had justice done them in the nursery, will transplant in November and bear a good crop of fruit the following season. In proportion to the bulk of the trees there is scarcely any fruit-tree that bears a heavier crop than the Gooseberry, and there is no tree that, during a time of pressure, such as a hot, dry summer, pays better for extra support or that is better able to assimilate and turn it to the best account. During a severe drought, when the bushes are heavily laden, if the ground beneath them is mulched and a soaking of sewage or even clear water is given, it has a marvellous effect in bringing the fruit to perfection. The adaptability of the Gooseberry for all positions is not taken advantage of to the fullest extent. There are everywhere hundreds of feet of bare walls and fences in north and other aspects that would yield a good return if planted with Gooseberries or Currants. They might be planted 4 ft. apart, and the branches trained up vertically palmette fashion, and in this way walls or fences would soon be profitably covered.

Pruning.—Gooseberries do not receive so much attention in summer as regards pruning as they require. The fruit would be better flavoured and finer if the young wood was thinned out with a pair of small pruning-scissors towards the end of June, keeping an eye upon the shape of the bush at the time, so that its symmetrical outline is not marred.

It is not often that market growers over-prune; if they err at all it is in the opposite direction. But I am convinced, among amateurs who take a warm interest in their gardens, and who are apt sometimes to ride their hobby too hard, that a serious loss of crop does result from too much knife-work in the case of Gooseberries and probably other fruits also. The best way of pruning the Gooseberry—especially on good land of a heavy nature—is to thin out the young shoots in summer when they have nearly completed their growth. This will consolidate the wood left for bearing, and let in the air and sunshine to ripen the fruit. In the autumn or winter, when the leaves are down, the bushes should be gone over again to put them into shape, and any more thinning that may be required should be done, and the unripe points of the shoots may have a few inches cut off them; but the less shortening they receive the better for the fruit crop. Excessive pruning has the same effect everywhere in a greater or less degree—that is, it causes the production of a redundancy of soft wood that cannot bear fruit, because it never acquires sufficient ripeness or firmness; and in the case of Gooseberries when closely spurred in, the parts that would if left bear fruits—viz., the ends of the shoots—are generally cut off. I have often seen the bad effects of severe pruning in the case of Gooseberries. The bushes run wild from want of a load to steady them, which was cut off at the autumn pruning. Let the face of the cut be smooth, and to accomplish this the instrument used must be sharp. A rough, jagged wound takes longer to heal, and looks slovenly and unworkmanlike. The same objection may be urged against those long sloping cuts which the late Dr. Lindley called ladies' cuts. Sever the branch near a bud by placing the knife on the opposite side to it, cutting *through to* the side on which the bud is placed at an acute angle. A little practice is worth a good deal of theory, although all theory that is based on sound practice is calculated to help us to understand and master the subject quicker, and more easily and thoroughly; but in performing any operation, unless we closely observe its effect, we fail to learn all that the subject-matter is capable of teaching. Thus, in pruning, say a Gooseberry bush, we should observe the trees carefully the next year, with a view to discover whether we have pruned too much or too little, and be guided accordingly. In this way a sound system of management will be built up, at least so far as the Gooseberry is concerned.

Caterpillars and Birds.—Green fly sometimes curls up the young leaves, but the chief enemies to the Gooseberry are those just named; and if the birds would only eat the caterpillars, as it is sometimes claimed they do, the mind of the Gooseberry cultivator, would be set at rest; but until that happy time arrives, both have to be reckoned with and circumvented in some way or other. Where bullfinches are numerous they must be shot, and the same course of treatment is best for sparrows also. There is no fear of the sparrow being exterminated; I daresay we should miss them if they were, the same as we should the flies, or any other domestic insect or animal whose existence is not of prime necessity to our welfare, but the sparrow is a wide-awake bird, and knows how to take care of himself. I have sometimes on a dark night taken a bat-fowling net and gone round his lodgings, but he always sleeps with one eye open, and is not easily caught. But in this, as in all other matters, prevention is better than cure; and there is more than one way of preventing birds eating the buds of Gooseberry bushes. The buds may be made distasteful by syringing some thick liquid over them that the birds do not like. A mixture of soot and lime is the simplest, and will not cost much either of time or money, and adheres pretty closely to buds and boughs; and I have generally found that when they taste anything that disagrees with them, they are not often troublesome in the same spot again, even when the dressing has worn off and disappeared. But to make sure, the trees should be syringed again after Christmas. I don't like the idea of leaving the pruning of Gooseberry or other fruit-trees till the spring, in order that the birds may work their will upon them when they may be kept away. Another way of keeping off birds is to act upon their fears and suspicions, and tie dark-coloured twine or thread from branch to branch and bush to bush, especially over the tops of the bushes, where the birds like to alight to begin their depredations. This is usually effectual in keeping them off, but not always; for sometimes they will not be deterred where the birds are many and the food-supply small. The caterpillars may easily be kept down by hand-picking if taken in time, but as they cling to and feed upon the undersides of the leaves, the enemy can effect a lodgment almost unperceived. In dealing with an evil of this or any other kind, we should first ascertain something of its cause and history. The fly, the origin of the caterpillar, measures about five-eighths of an inch across the wings when extended, and the body is about three-eighths of an inch long. She lays her eggs along the ribs of the leaves in rows; the eggs grow rapidly, and the grubs are usually hatched in less than a week, and begin feeding on the leaves at once. This being so, it will be obvious that where we have a suspicion of their presence, or if the flies have been noticed round the bushes, if we find and pick off the leaves on which the eggs have been laid, we could destroy them and prevent them doing mischief. I may say the fly is a gay-coloured insect, throat yellow, with black spot above and below, body yellow, with yellow legs and black feet; it has four wings. In a couple of months the grub comes down from the tree to the soil, in which it burrows 2 in., 3 in., 4 in., or more according to its firmness, where during the winter it gradually undergoes a change, and emerges as a fly in the month of April or beginning of May. From eggs laid the beginning of May the insect will sometimes go through its changes by July 10 or soon after, the first brood taking about twenty-eight days; the second will remain underground till the following spring. A good remedy is to make the ground as firm as possible by treading or beating all under and round the bushes as far as the branches extend to prevent the grubs burrowing, and by removing some of the surface soil in winter the bushes may be kept free from them. Other remedies are dusting the bushes with hellebore powder—tying the material up in a piece of muslin, and shaking it so that the powder may rise and envelop the leaves. The powder should be put on when the bushes are slightly damp. Shaking the bushes will generally make the grubs drop to the earth, when they can be killed or captured. To destroy the Gooseberry caterpillar, a friend sends me the following recipe, which he has used nine years with success. In winter take a bucket of coal tar and a brush made by tying a handful of straw on the end of a stick; dip the brush into the tar and sprinkle the latter over the surface of the soil as far as the branches extend, and stir up the soil with a rake. An ordinary-sized bucket of tar will be sufficient for 100 bushes. Where the trees have been badly infested it will be advisable to give another light sprinkling in February.

SELECT LIST OF GOOSEBERRIES.

Red.—London, Roaring Lion, Warrington, Raspberry, Champagne, Wonderful, Crown Bob, Beauty, Companion.

Yellow.—Gipsy Girl, Leader, Oldham, Gipsy Queen, Criterion, Golden Ball, Pilot.

Green.—General, Lord Eldon, Washington, Rough Green, Stockwell, Queen Victoria, Pitmaston Gage.

White.—Antagonist, Snowball, Eagle, Wellington's Glory, Hero of the Nile, Whitesmith.

Heavy Exhibition Kinds.—Dan's Mistake, Conquering Hero, Leveller, Catherine, Stockwell, Telegraph, Careless, King of Trumps, Antagonist, London.

THE BLACK CURRANT.

The Black Currant may be planted on good land in any situation, and it thrives better than most things in moist, shady corners, or on the north side of a wall. In dry soils the ground over the roots must be mulched with manure, or the fruit will be small, and an occasional soaking of sewage will be very beneficial. The Black Currant does best planted in beds or quarters, with no other kind of bottom-growth mixed with it. It forms also a profitable crop under tall Apple or Pear-trees, as it will do well in the partial shade. Its management and pruning are exceedingly simple, and consists in keeping the trees always well furnished with young wood, as it is on the young branches of the previous year that the crop is borne, and unless these are more than 1 ft. in length they should be left unshortened. The best way of pruning the Black Currant to insure a regular and even crop of fruit annually is to thin out a certain proportion of the old branches every year and encourage the production of young wood to fill up. In this way the Black Currant will continually renew itself, and go on bearing many years; and the best way to treat any old worn-out-looking bushes, instead of destroying them, is to cut them well back into the old wood, and thin out the young shoots that break from the old stools—thus, excellent fruiting bushes, with a long period of usefulness before them, will be obtained. The Black Currant can hardly be said to wear out, hence its value in every garden. No doubt one reason of this is, it is not exhausted by carrying its crop over long. When the fruit is ripe, if it is not gathered it begins to fall; unlike most of the other berry-bearing bushes, it scatters its load if not eased of it, and this makes the trees long-lived. The propagation is easily effected by planting cuttings a foot or so long. The Black Currant, in the course of years, is almost sure to become a stool rather than a single-legged bush, and I don't think in this case it is so objectionable as it would be with the Gooseberry or the Red or White Currants. In the latter case, permitting the growth of suckers will almost certainly throw the system of the trees out of gear, and lead to unfruitfulness. But in the case of the Black Currant, when the bushes are advancing in years it seems to give them a much-desired stimulus. Of course the knife must be used freely to thin out the old wood, so that the young shoots can have a chance of ripening. Black Currants should be planted at least 6 ft. apart each way.

RED AND WHITE CURRANTS.

The White Currant is usually less vigorous than the Red, and is generally of dwarfer habit, consequently may be planted rather closer together, and therefore it is better that each should occupy a row, or it may be a plot or quarter to itself, rather than be mixed indiscriminately. The fruit of Red and White Currants will hang in a good state of preservation till October if protected from birds, and they readily yield to almost all forms of training. Every bit of vacant space on the worst aspects of walls or fences may be planted with Currants; they may be trained as two or three-branched cordons, or seven or nine-branched palmettes, and in either way will rapidly cover a 10-ft. wall. All that is required is to shorten back the leader of a young plant, to obtain two good shoots to lay in at right angles horizontally on each side of the main stem, and from these obtain a sufficient number of shoots to train up vertically. But the two shoots which are to form the foundation of the framework of the future tree should be led out diagonally during summer to obtain greater strength, and at the winter dressing be dropped down to the horizontal line. The young shoots that break up the sides of the main stem should be stopped back to three or four leaves in June, and be finally pruned back to 1 in. or so in winter. The Red and White Currants bear freely under the spurring system; of course, young shoots should be left to fill up vacant spaces, and it is beneficial to all fruit-bearing trees to feel the impetus which a new shoot or two gives, especially in the case of old bushes; it seems to impart new life and vigour to them. The basin is the best form for bushes to assume, whether dwarfs or standards, and as I have referred in treating of the Gooseberry to the ease with which an intelligent pruner, wielding a sharp knife moulds the growth of a tree, simply by cutting to a bud pointing in the direction the branch is required to take, I need not further dwell upon it here. Standard Currant bushes with clear stems from 2 ft. to 3 ft. high are interesting little trees, and are easily made by pruning the bush to one stem till the requisite height is reached, then open out the centre in the same manner as is done in the ordinary dwarf bush form. The only objection I have to these standard trees is they seem more liable to form suckers than the low bushes do. The reason probably is the stem does not swell in proportion to the head, and the circulation between the top and the roots is rather impeded in consequence, and so the sap that cannot find a passage up the stem bursts out at its base. The White Currant may be planted about 5 ft. apart, and the Red about 6 ft. They will not, of course, occupy all the space for several years, but dwarf-growing vegetables, such as Lettuce, Endive, Cauliflower, &c., may profitably fill up all vacant ground. Before planting any crop that will occupy the ground at least a dozen years, it is important that the land should be placed in a good fertile condition; for fruit bushes that, like Gooseberries, Currants, and Raspberries, seldom fail to bear every season must be well fed, and it is essential that the ground be well and deeply cultivated and well manured. After the trees settle down to their work, and the roots are fast occupying the land, there should be no digging with the spade, but every season after the pruning is finished the ground should have a dressing of short manure (soot and lime are also useful), and be forked over. I always like to get this work done soon after the leaves fall, at any rate before Christmas. The roots are never idle, and this autumn top-dressing is placed within their reach by the winter's rains. In dry, poor, sandy soil mulching in summer is exceedingly beneficial, and adds much to the value of the crop. It is sometimes considered advisable to defer the pruning till spring, in places much infested with sparrows and other bud-eating birds; but I think it is far better to prune early and dress the bushes with something that will make the buds distasteful. However, the buds of Currants do not suffer so much from the depredations of birds as do those of the Gooseberry. As soon as the fruit begins to change colour the birds, especially the blackbirds and thrushes, will begin to take it, and if not scared off with a gun, or the fruit protected by nets or mats, a very few days will see the produce of a large garden carried away, as all the birds in the neighbourhood will come to help in the work. The Currants, like all other things under cultivation, are subject to insect attacks, but the most common and the most destructive are the green aphides, which attach themselves to the undersides of the leaves, causing them to curl and blister, and ultimately to fall off. The garden engine with soap suds or soft soap and water well soused among them will dislodge a good many; even clear water will be very useful if taken in time. The fly usually attacks the ends of the branches first, and often the best and most expeditious way is to cut off the curled ends of the shoots and burn them. The bushes suffer no injury from this decapitation, as it is not often the flies are really troublesome before June, the time for summer pruning. The caterpillar sometimes attacks the leaves, and if not checked speedily does a lot of mischief. Hand-picking is the best remedy. If taken in time a few sharp-eyed children will soon clear a large garden. See also what has been said on this subject in the case of the Gooseberry.

SELECT LIST OF CURRANTS.

Red.—Raby Castle, Red Dutch, and Red Grape.
White.—Victoria and White Dutch.
Black.—Lee's Prolific and Black Naples.

THE RASPBERRY.

Though the Raspberry is usually classed with bush fruits, yet it is not a bush, but a cane that renews itself annually from its base. Thus, whilst one set of canes are bearing fruit the next set are in the midst of growth. The process of fruiting exhausts the old canes, and having fulfilled their mission they die, and are, or should be, removed early in autumn to give space for the young canes to carry on their work. A plantation of Raspberries on good land, of rather a moist tendency, will last a good many years, but it is never advisable to allow them to remain on the same plot too long to become weak and debilitated, as such plants are not adapted for forming a new plantation, they take too long to establish themselves. Therefore, whether Raspberries occupy a position a greater or a less time signifies little, if they are removed whilst still in their full vigour. At the same time, when moved often, say every eight or ten years, a crop of fruit can be secured the first year, as the stools, being of a manageable size, may be lifted entire and planted elsewhere without receiving much, if any, check, and, under such circumstances, the wood is short-jointed and fruitful.

Modes of Training.—There are various ways of training the Raspberry, but in garden culture there is no better way than driving in stout posts in rows 6 ft. apart and 10 ft. from each other in the row. The posts should be about 5 ft. or 5½ ft. out of the ground, and if the bottoms are charred they will last several years, and when they wear out are easily replaced by others. On these posts should be strained a couple of rather stout wires, one on the top, secured by small staples or flat-headed nails, and the other about half-way up; against this trellis the Raspberry canes should be trained, but the trellis need not be erected till the year following the planting of the Raspberries, as if planted in the ordinary way with suckers there will be no crop the first year; but when the Raspberry is made to fit into any regular system of rotation, and moved at the end of any limited number of years, the trellis will be moved with it. In planting Raspberries against a fence of this kind, the stools may be closer in the row than in ordinary culture, so as to furnish plenty of canes to cover the trellis; but there is no advantage in training the canes nearer to each other than 6 in., as the leaves must be allowed breathing space, in order to impart size and flavour to the fruit. Autumn is the best time to plant, but Raspberries are planted any time in open weather up till March. Another way of training the Raspberry is to plant in rather thick rows; drive in stout stakes about 4 ft. high on both sides of the row and about 2 ft. or 2½ ft. from it. A lath or a wire is secured to the top of the stakes all round, and the fruiting canes are drawn across and tied to the lath. This is not a bad plan to adopt where the plantation is to stand a number of years in one position, as full justice is done to the young shoots, they having all the centre of the space to themselves, and are consequently very strong. The lack of attention given to the young wood upon which the future crop depends is in many places a weak point in the management. The common plan is to allow the young shoots that break away from the base to grow up among the fruiting canes, doing injury to them, and from their crowded condition placing a check upon proper and necessary development. I need scarcely refer at any length to the old-fashioned way of planting the canes in clusters of three or four, and tying them in a bundle to a stake, as everybody must be familiar with it. Raspberry canes, however they may be grown, must have light and air, and this is as important for the young canes during growth as it is for the fruiting wood; indeed, it is more necessary, as with all such plants the fruiting powers depend upon the previous preparation, and any system that produces over-crowding does not permit of the full development of the fruiting capacity of the plant. Raspberries are often planted in rows, and arched over from one stool to the other—

i.e., half the canes are bent over on opposite sides to meet their neighbours, when their extreme ends are secured to each other to form an arch. This is not a bad plan to adopt where stakes are difficult to get, but in windy districts the fruit sometimes gets damaged and blown about. In field culture a different system has to be adopted, as stakes can seldom be had in sufficient quantities, and the plants must be self-supporting. This object is obtained by reducing their length, which enables the rows to stand nearer each other. The rows under this system may be 4 ft. apart and the stools 3 ft. apart in the row. The canes are cut down to 3 ft. in height, and, being grown under a system of full exposure to light and air, they acquire strength to become at that height self-supporting.

New Plantations.—If young plants have to be purchased, or if young single canes of home growth are used, it will be better to cut them down nearly to the ground the first season, as in most cases they will be too weak to bear any fruit; but crops of vegetables may be planted between the rows of Raspberries during this their probationary year. Early Potatoes, Cauliflowers, Lettuces, or Spinach, or any light summer crop will be suitable. After the Raspberries are once established there is not much expense in their culture, as they are better without having the spade among their roots. They root close to the surface, and if the roots are injured by the spade there is quite a useless production of suckers, which tend to exhaust the plants. After the old canes are cut out, which should be done as soon as the fruit is all gathered, the young canes should be finally thinned out, and as soon as the leaves have fallen they may be trained, and then a dressing of manure may be applied and lightly forked in not too deeply to break up the roots, as it will not matter if the manure is not all buried

The loosening up of the crust in early winter is, I think, very beneficial, by letting the air into the land to ameliorate and correct its condition, which, if at all heavy after being trodden a good deal in gathering the fruit, will have a tendency to become close and sour, and this annual stirring up seems to correct it and put it right. Small sprays of Golden Willow will be found suitable for tying the canes to the wires. In places exposed to strong winds matting is not strong enough to bear the strain, and it is disagreeable to have the canes blown about when in fruit. If the whole surface between the rows can be mulched with manure or grass about the middle of June, the fruits will swell much finer, especially the late ones; and this mulching in dry weather on all soils is beneficial, and on dry soils it is indispensable. Grass will do if manure cannot be had; it should be put on 3 in. or 4 in. thick. It is generally desirable to have a succession of Raspberries for as long a period as possible, and there are several kinds which bear in the autumn on the young wood made the same summer; these of course require different treatment from the summer-bearing kinds, and they may be planted on warm rich soils. The whole of the canes should be cut down to the ground every winter. If the young shoots are too numerous in the spring, some of the weak ones should be removed. In the management of the young growths in spring, only a sufficient number should be left to grow up to fill the trellis, all beyond that necessary requirement being a tax upon the plant's resources, and a hindrance to well-doing. There is a way of obtaining a succession of Raspberries by pinching off the points of the young side-shoots when about 3 in. or so long in May. This delays the fruiting, as the operation removes the flowers, and the plant *has to break* out afresh, and in some cases dormant eyes or buds push from the cane, especially if the wood has been well ripened.

Propagation.—In the propagation of the Raspberry all new varieties are of course raised from seeds; and in ordinary culture plenty of young plants may be obtained for making new plantations by saving the suckers that commonly spring up a short distance from the base of the stools. New or scarce kinds may be increased by layering; peg the long shoots down just beneath the soil, and cut a notch just below each joint to arrest the sap there and thus induce the formation of roots.

GOOD VARIETIES.—Cornwall's Prolific, Fastolf, Northumberland Fillbasket, Pearson's Prolific, Prince of Wales, White Antwerp, and Semper Fidelis (for autumn).

THE STRAWBERRY.

Land that will grow good Wheat, Beans, or Potatoes will grow good Strawberries, but as the latter crop remains, as a rule, longer on the land than either of the former, it should have a better preparation before planting. Different views are entertained about this matter: some think simply trenching and levelling the surface sufficient, and so it may be where the land is submitted to the same deep working annually, or even biennially, but in the majority of cases the Strawberries will do all the better if the land has been trenched in autumn or winter, burying most of the manure 1 ft. or so deep, and then taking a crop of early Potatoes the following season before the Strawberries are planted. The stirring and working of the land necessary for the Potatoes brings it into fine condition for the Strawberries. The Potatoes will generally be cleared off in July, the land levelled, and the Strawberries planted about the first or second week in August. There need be no digging unless more manure is required, but a bushel of soot per rod scattered over the surface and worked in with the Dutch hoe will be beneficial. There are two things that I attach a good deal of importance to in Strawberry culture, and these are to well firm the land and to plant early. Planting in fresh, deeply-stirred land will not do so well. The roots rush away downwards quickly in the loose soil, making at the same time a corresponding leaf growth; and though the casual observer might think from the progress made that all was well, yet it is not so. Very far from it, the leaf-stalks are long drawn out, and the crowns never acquire the substance that firm ground gives. It is the dense crown of good leathery leaves, set on short foot-stalks, that gives the fine clusters of fruit, and to obtain this result the ground must be firm, and the plants must be firmly embedded in it. I do not wish to be misunderstood, and therefore repeat, though the ground must be firm, any one who thinks the hard solid firmness of unmoved soil will suffice will be grievously mistaken. To secure a good crop of fruit the first season not only requires good land well prepared, but good plants are essential; and the majority of cultivators would say: "Oh, layer them in small pots early, keep them well supplied with water, and you will have strong plants to turn out in August." The only drawback to this is, if there is a large breadth to be planted much time is consumed, and if you want to replant a portion of your stock annually, and you may have in addition a lot to prepare for forcing, the chances are, when the forcing stock has been secured, the open-air plantation will be composed of weakly, wasted plants only. Of course this need not be so necessarily, but in some cases I am afraid it will. However, there is no doubt layering early in small pots, although an expensive way, is a good one; but for the purpose of open-air planting, cutting up a large number of sods of turf into pieces about 4 in. square and laying them round the old stools conveniently and pegging the runners on them will answer very well, and, when the young plants are rooted, sods and all may be planted together. I consider this a better way than leaving the plants to starve in small pots. The worst plan of all is to take the runners indiscriminately from the beds without any preparation. Such plants cannot be expected to bear much fruit the first year. Where the plantations are renewed often, and are not left long enough on any plot to become exhausted, dividing the crowns and planting out the healthiest and best is not a bad plan. We seem to forget, when we insist upon the Strawberry being propagated from runners, that it is simply an evergreen herbaceous plant, and that it may be propagated in the same way we should adopt with similar plants with very good results. Under this system Strawberry plantations might be moved on to fresh ground annually, or at the furthest every two years, with very good results, and with far less trouble and expense than layering the runners in small pots; the Strawberries might thus in rotation go the round of the garden like any other crop. As regards the distances at which Strawberries should be apart, no hard or fast line should be laid down; the character of each variety should be considered, and the distances apportioned according to strength and vigour. Then, again, there are great differences in soil—on light land they should be thicker than on heavy strong land, as on the latter a greater development will be attained. But, giving due weight to all these considerations, the plants, of whatever kind they may be, if they are to receive justice, should not be nearer to each other than 18 in. In other words, every good healthy Strawberry plantshould have a space of 18 in. square to grow in. I am assuming that weakly plants will not be planted, only such plants as will bear a good crop of fruit the first year, and the space I have named is not a bit too much for plants that have been well managed. I have given 18 in. as the minimum distance, but the maximum on strong land and with vigorous growing kinds might be extended to 3 ft. square for each plant. There cannot be a greater mistake than overcrowding. When grown under such conditions the whole plant has a lean appearance, the leaves being drawn up, lack substance, and the clusters of flowers partake of the same weakly character; many of them will probably fail to set from inherent weakness. Then, again, when crowded too much, the fruit does not ripen so well, and in damp weather more of it is spoiled than if room enough had been given to let in the air and sunshine. Rich top-dressings are beneficial to Strawberries, as they encourage surface rooting, and such roots, being under the influence of solar warmth, are of more use to supply the plant's needs, except in the dryest season, than those roots that have penetrated the earth deeply. The two sets of roots, of course, are best, as those working deeply send up moisture in a dry season from a greater depth, and the surface roots tend to correct this action, which would otherwise disorganize the plants and produce barrenness.

Annual Planting.—If we look upon Strawberries as an annual crop, and work them in connection with early Potatoes, we should trench up a piece of land every winter, manure it, and plant it in March with Myatt's Prolific. These would be lifted by the end of July, and the Strawberries planted as early in August as the fruit was gathered. Treating Strawberries simply as we should do any other kind of evergreen herbaceous plant, we should not care for runners, and if it was not for the labour involved the runners would be better removed in their infancy. In growing fruit for a private family we must, of course, have a long season without any break; but in growing Strawberries for market we should contrive to have the bulk of the crop either early or late, or both, if we grew fine kinds for dessert. Of course, to supply contracts for preserving it would matter less about their time of ripening, but early and late fruit sells best in the ordinary course of trade, for the simple reason that it is altogether a question of supply and demand, and in the middle of the Strawberry season the markets are generally glutted. If the plantations are permitted to stand two or more years the runners should all be cleared off as soon as the fruit is gathered. Some growers plant a bed on purpose to supply runners, and keep the fruiting plants as free from runners as possible, and this is a good plan, if some pains are taken when planting that none but prolific plants are employed. To insure this I have sometimes planted in May, when the plants are in flower. Moved into good fresh land and mulched, they sustain little or no check. A gentle slope, with a southern aspect, is well adapted for the early Strawberry plantation, whilst the late bed may slope in the opposite direction or to the west, planting Vicomtesse Héricart de Thury, Black Prince, and Keen's Seedling in the former position, and Sir C. Napier and Elton Pine in the latter. The Old Scarlet is a good kind for preserving. British Queen, Dr. Hogg, Sir J. Paxton, President, Loxford Hall, and Alice Maud are also excellent kinds. Whenever the plants seem to require extra support, top-dress early in spring with good manure, and mulch with long stable litter as soon as the blossoms appear. The mulching is important, as it keeps the fruit clean and checks evaporation. In very hot seasons a good soaking of liquid manure just as the fruits are set, or even of pond water, will be very beneficial.

Strawberries in Pots.—I am not going fully into the question of forcing Strawberries, but I have known such profitable results obtained in cold pits and houses with Strawberries in pots, I could not refrain from making a remark upon it. There is often a break in the supply just about a week or ten days before those in the open ground are ripe, and sometimes the springs are late, and then this interval is longer, and this adds to the value of the cold-pit crop immensely. So far as the London markets are concerned, the French will enter into competition; but in all the large towns of the north and midlands more Strawberries might be profitably disposed of in May and the early part of June. For giving a few fine fruit young plants are certainly the best, and if I had been writing this a dozen years ago I should have said young plants were always best, but further experience with keeping Strawberries a second year has modified my opinions respecting them, and I always save the best of the forced plants for a second season, instead of providing so many young runners. They are set aside and are supplied with water till there is time to pot them; then they are shaken out and treated as young plants, potted firmly in good soil and clean pots, and excellent results in the weight of crop follow. A number of them may be picked out for autumn fruiting if it was required, as blossoms will show on many of them. I have lifted Strawberries from the open ground in April, and planted them rather thickly in good soil in unheated pits, and have been satisfied with the result, and this, of course, saves the expense of pots and potting. Plants so treated commence to make new roots at once when put in the pits, and the fresh rich soil tends to swell off the fruit to a good size. Of course the flowers must have been hidden away in the crowns in the autumn, as no amount of feeding in spring will generate blossoms. Strawberry plants with strong crowns, moved from the open ground in April, planted in boxes, and placed in cool, light houses, near the glass, have matured an immense crop of good berries at a small cost, either in labour or material. I should rather leave the plants out in the beds all winter and lift in the spring for this work than pot or box them in autumn, as there is always a danger of plants in pots being dried too much or checked in some other way, and the cool open-air treatment seems to act beneficially.

FILBERTS AND COBNUTS.

When so many are looking about for something profitable to plant, why are these not more grown? In a good season the profit per acre is very great, and good Nut seasons are more frequent than with other kinds of fruit if we except bush fruits alone. The Hazel grows in the woods and hedges all over the country, and wherever the common Nut thrives well there the Filbert may be planted. A light well-drained loam suits them best, and it should be well and deeply broken up a month or two before planting, and it may have a good coat of manure, as I propose taking a crop of Potatoes or some other vegetables between the rows, as much for the purpose of keeping down weeds as for the direct profit realized by it, although that may be considerable, sufficient at least to pay rent and labour. November is the best time to plant, and if the Nuts form a plantation of themselves (and this I should recommend) they should be planted 5 ft. apart all ways—*i.e.*, each plant should be allowed a space of 5 ft. square. In the course of a few years every alternate bush and every alternate row may be taken out, and be planted in fresh ground to form a new plantation, leaving the bushes in the original one 10 ft. apart, and this distance under the Kentish system of pruning will give plenty of space. In the Nut orchards in the county I have named considerable pains are taken with their pruning, so as to make them assume that shape that induces the earliest and the greatest fertility. The spherical form with a hollow centre is found to yield the best results, and the training begins as soon as they are planted. Low, wide-spreading, open-hearted bushes, abounding with small short-jointed young spray, clustering thickly with buds, are the kind of trees we want, as this is the kind of wood that bears the Nuts in triplets, bunches of fours and fives. An unpruned tree makes its way rapidly upwards, the base soon becomes bare, and the fruit is neither so fine or so numerous. It is the sunshine that gives us the Nut harvest, as it does all the fruits and flowers of the earth, and its life-giving fructifying rays cannot penetrate the thick unpruned heads, and so, when the trees have been planted a number of years, the Nuts become small, and are often few in number. Nuts are very apt to throw out suckers from the base of the main stems; these, of course, must be removed, and the best way is to take them one by one in the hand, and by a sharp movement of the wrist twist them out. If cut off with the knife a base is left for the production of another and larger crop, but twisting them out usually destroys their source. In the Nut the male and female flowers are separate and distinct; in the former a brown catkin appears in December, and about the time the pollen is ripe the female flower, a small, delicate, red tuft, appears thickly protruding from the buds at the ends of the shoots. Without a good supply of the male catkins of course the Nuts will not set, but branches of the common Nut, if they are furnished with catkins, will do just as well for fertilizing purposes as their own flowers; and branches of these, whenever necessary, may be cut and placed in the heads of the bushes, so that the pollen can fall or be carried by the wind over the branches on which the female flowers are situated.

SELECT LIST OF FILBERTS AND NUTS.—Red Filbert, White Filbert, Waterloo, Cosford, Pearson's Prolific, Frizzled.

COB NUTS.—Kentish and the Round.

THE FIG.

It is only in favourable situations that the Fig may be looked upon as a profitable fruit to grow. In the south of England it rarely fails to bear good crops of large luscious fruit. On the east coast, too, I have seen it do well, and in some parts of the midlands the result is satisfactory. Everywhere, except in the south, Fig-trees make too much wood when left to themselves, and this wood does not ripen. Experience teaches us that the only way to secure a crop of Figs is to curtail and cramp the roots, and in cold districts during cold winters to protect the wood. In ordinary winters a Fig-tree with roots under control will not need protection, but few of us are weather-wise enough to tell beforehand when a sharp winter is coming, and so to be safe covering will have to be used every winter. Spruce branches will do very well secured to the wall. The branches of the Fig should be un-nailed and secured together in clusters, for then they are more easily protected; this need not be till November, or perhaps till after the first frost sets in, provided the materials for covering are all handy, as it is not often the first night's frost is a severe one.

Borders.—The most important point, however, in Fig-culture is in preparing the border for the roots, and this should be done well. Shallow borders are best. I am, of course, not referring to the south, as there I have had excellent crops of Figs without making any special border. Somehow there they do not make so much wood; very little pruning is required, which may all be done in summer, unless it may occasionally be necessary to cut out a large branch for the purpose of getting up young wood. The bottom of the border should be made impervious to the roots; on that hard bottom 8 in. or 9 in. of drainage should be laid, giving it an inclination to the front, where a drain 1 ft. deeper than the bottom of the border should be made with a clear outlet, into a main drain of sufficient capacity to carry off all water quickly. Three-inch pipes may be used in the drain in front of the border, and stones or brickbats should be placed on top of the pipes instead of earth. Good turfy loam should form the staple of the border, but some old plaster, or the *débris* from old buildings may be added in proportion to the character of the soil, sandy loam requiring less than if it be of an adhesive nature; a few ½-in. bones will be beneficial, and these are all in the way of manure that will be required at first. Later on, when the trees begin to bear freely, mulchings and top-dressings of manure mixed with wood ashes may be given about 3 in. thick every summer. Some cultivators recommend the border to be walled in with bricks to keep the roots at home, and in some situations this may be desirable; but in most cases this will be a needless expense, as if the bottom be made firm and dry, the roots can be lifted along the front and shortened whenever it is desirable or necessary and if a brick wall be built underground, unless it be more than 9 in. thick, the roots after a time will bore through it. I have found the roots of Fig-trees that had penetrated through a 14-in. wall.

Pruning.—The chief points in Fig-culture, are first, a good sound, dry, firm border; second, early disbudding of the young shoots to let the sun and air have free play amongst them, at the same time keeping the trees well supplied with young wood, as the young shoots alone bear fruit. And to obtain this end it may be necessary sometimes to cut out a thick shoot or two of several years' growth to give more room for young wood to lay in; so that the tree may be fruitful all over its surface, and not merely at the extremities of the branches; and thirdly, protect in winter if experience in any particular locality has proved it to be necessary, using dry materials, such as bracken, spruce branches, haybands, straw, or mats, but do not put the protection on earlier than necessary, and remove it by degrees as early as is consistent with safety. The Brown Turkey, the Brunswick, and the White Marseillaise are excellent varieties for open-air culture, being hardy and prolific. Figs will often push a second crop late in summer, but in our climate these are useless, and should be removed, as they only help to exhaust the trees unnecessarily, robbing those young fruits that are still snugly ensconsed at the base of the leaf-stalks, and which will form the first and only crop that can be relied upon coming to perfection in this country.

Propagation.—Figs are easily propagated from cuttings or layers, also from suckers and seeds, but for increasing old-established sorts the two first plans are the best. Cuttings 8 in. or 9 in. long taken off with a heel when the leaves fall in autumn, planted under a handlight two-thirds of their length, will root the following spring, and make nice little plants during the summer. If there is a frame and a little bottom heat, the rooting will be effected more expeditiously, if they are planted in pots and the pots plunged in the bed. Figs transplant well; if the work be done carefully, they do not seem to mind it much. Very old trees that are making too much wood may have their roots lifted clean out of the soil, and have a new border made under them with great advantage, although when this is done it is always best to reduce the head a little at the same time. The best time to lift old trees is in autumn, although I have, when the work could not be done then satisfactorily, transplanted in April when the sap was rising. A modified form of the fan and horizontal is the best way of training the shoots. Thus the shoots are led away from a common centre, as in fan training, and then brought down to the horizontal line and taken straight from that point along the wall.

THE GRAPE VINE.

One of the causes why the Grape Vine as an open-air fruit has been neglected of late years may be traced to the introduction of cheap glass-houses. Every gentleman now has his Grapes all the year round grown under glass. At the beginning of this century more attention was given to the Vine on walls in the open air than it receives now. Then the best gardeners in the country directed their efforts to its culture, and as a consequence better fruit was grown. Now that it has disappeared from great gardens as an open-air fruit, cottagers and middle-class people have no good examples of training or management to guide them, and as a consequence evidence of neglect is everywhere perceptible. Example is, as is well known, better than precept, and if good examples of open-air Grape-culture were plentiful, a stimulus would be given that would lead to improvement everywhere. Mr. Forsythe, gardener to George III., writing at the close of the last century, mentions a great many kinds of Grapes that he grew in the Royal Gardens, at Kensington, He also states he sent in for the use of the Royal family 378 baskets of open-air-grown Grapes in one season, each basket weighing about 3 lb.; he mentions too, that many of the bunches weighed over 1 lb. each. The best cropped and managed open-air Vine I have seen this year is in a clergyman's garden in the Fens, and consists of young wood. This is, I believe, the great secret in open-air Grape-growing—keep working up a constant supply of new wood. But there must be space allowed for each leaf or the wood will not ripen. The Grape Vine thrives best in a warm dry calcareous soil; and when planting a Vine we should try to meet its wants as far as possible. A south aspect is indispensable to obtain the best results. I have often met with Vines on eastern and western aspects, and sometimes they bear good fruit, but none but warm sunny spots should be selected, as there are plenty of fruits that will do well on an inferior site.

Borders.—Where the soil is cold and adhesive, the worst should be removed, an impervious foundation made, a bed of stones for draining 6 in. thick laid on the bottom, and a good drain led along the front to carry off all surplus water as it falls. On this the border should be made of good sound loam, rendered porous and calcareous by adding old mortar and plaster with the hair it contains. Parings of hoofs of horses from the blacksmith's, crushed bones, old woollen rags, and parings of leather from the shoe manufacturer, are excellent things for putting in a Vine border; they are so lasting, giving off their strength just as it is required, and do not clog up the pores of the soil as ordinary manures do. Vine borders may either be made by instalments or all at one time. There is a difference of opinion about it, though I confess I like to do the work by instalments: but I was talking to a Grape-grower last spring whose opinion is entitled to great weight, and he said make the border all at one time—doing it by instalments leads to unequal settling and rupturing of the roots. I have stated both sides of the question, but I have never found any disadvantage from piecemeal work. If the site be rendered perfectly dry, the border may be from 2 ft. to 3 ft. deep, but it should not be less than the former or more than the latter, and it may with advantage in some instances be made partly above the level of the ground, and it should not be less in width than the height of the wall. The border may be made any time in dry weather when the soil works cleanly. I know but few people take all the pains I have here set down with their borders for Vines, and that and the neglect visible in the summer management are the reasons why they do so badly. I often hear people say: "Oh! we can't fight against the climate;" but we can if we like, and although we may be sometimes worsted in the struggle, yet I am convinced a gratifying amount of success will be obtained. If the roots of a plant are kept in a comfortable state and the right kind of food placed within the plant's reach, if we so regulate the branches as to give a proper balance to the plant, maintaining a regular flow of sap to all its parts, keeping up a constant succession of bearing branches by cutting out a certain proportion every year, and training up young shoots to take their places, I am sure that a change for the better would soon be visible in the open-air Grapes.

Planting and Propagation.—The best time to plant young Vines is when they can start into growth at once, that is to say, in spring or summer, and this will necessitate their being started in pots or boxes, or brought forward in sods of turf. I prefer the latter plan if the young Vines are raised at home, which is the best plan to adopt. The wood containing the eyes should be taken off at the autumn pruning, selecting only those that are strong and well matured, laying them in earth in the open air to keep them fresh. About the 1st of February as many fresh sods of turf should be cut as there are eyes to plant, and they should be about 6 in. square by 4 in. thick. The eyes or buds should now be cut out, leaving about ½ in. of wood on each side, cutting in a slanting direction from the base of the bud on the opposite side to it. A small hole should be scooped out of the centre of each sod, the eye or bud pressed firmly in, and the cavity filled up with light rich soil. When all are planted, place them close together in a close frame. A little bottom heat, if it can be had, will be of great service, but it is not indispensable, as the eyes will grow in a perfectly cool frame with no protection beyond the glass lights. A gentle bottom heat will cause an earlier growth; and that doubtless will be an advantage. The sods containing the eyes must at all times be kept moist, not positively wet at first, but just moist, increasing the quantity of water as the growth bursts forth and the young plant has formed roots to rapidly draw up the moisture. Ventilation, too, must be given as required, gradually increasing the quantity of air admitted until the lights can be taken off and the plants fully exposed to harden them previously to their being planted out. A small stake should be placed to each plant when 6 in. high, to support it and prevent entanglement with the tendrils of others. When planted out, which should not be till the nights have become quite warm in June, a hole should be made, the sod placed comfortably in it, and the soil made firm over and around it. I have gone somewhat fully into the matter, to show how very simple and efficient this manner of raising young Vines is. When Vines have to be purchased in pots, they should always be planted in March, just as the buds are bursting, turning the plants out of the pots, and carefully unfolding the roots, laying them out straight in the soil, covering about 6 in. deep, and mulching afterwards with 2 in. in thickness of manure. Water must be given when necessary, and, if young plants struck from eyes are planted, the shoot must be trained up vertically, unstopped, but if old plants are used, two shoots should be trained up instead of one. Pinch in all laterals during summer to one leaf, and in autumn, as soon as the wood is ripe and the leaves are changing colour, prune to within 3 ft. or 4 ft. of the base, or at least to firm hard wood. Another mode of covering a wall or building with Vines is to plant strong, well-ripened cuttings in autumn. As soon as the leaves fall and the cuttings can be obtained, take them off with a heel, and plant firmly. They may be from 8½ in. to 12 in. long, but only one eye should be exposed. The next question to be considered is the space each Vine is to occupy, and this must be in a great measure decided on the spot, and that decision should be influenced by the various surrounding local circumstances; for instance, if the natural soil be good, and the bottom dry and warm, I should scarcely place any limit to the distance the Vines may extend. Let each plant cover as much space as it can, and in planting young Vines, if we plant a number, perhaps one or two will display more vigour than the rest, and I should permit those sturdy, vigorous plants to extend, gradually cutting away and removing the others. This is leaving the fittest to do the work. Acting on this principle, it will not matter much whether we plant 4 ft., 6 ft., 8 ft., or 10 ft. apart, although the height of the wall must be taken into consideration.

Training and Pruning.—At the end of the first year the young Vines will have one good stout well-ripened rod or cane. This was pruned early in autumn back to say 3 ft.; before the sap begins to rise in spring we train this rod vertically a short distance, say 1 ft. or 15 in., to form a main stem, and then lead it off horizontally at right angles to the left. As the buds break, one close to the main stem will be taken to the right a little obliquely, and others will be selected and trained up vertically; in short, the framework of the tree, when finished, will be composed of two main branches trained along the bottom of the wall, with vertical branches radiating at about equal distances from them at about 18 in. apart. Disbudding should be commenced early, taking off the weak shoots when quite small, 1 in. or so long, weeding out the weakest until only a sufficient number are left to furnish the wall with as many stout leaves as can find room for development. The leaves are the plant's most important organs, and should occupy most of our attentions. If they are weak and puny we shall have no fruit to boast of, but if large and leathery, good large bunches may be safely looked for, and good-sized berries also. The bearing shoots should have their leaders pinched when two leaves beyond the bunch are perceptible, and all laterals should be pinched to one leaf, and no lateral growth allowed beyond. The winter's pruning should be done as soon as the leaves fall, and, as suggested in the early part of this chapter, lead up a few young shoots and take out a corresponding number of old ones every year, and so a continual succession of new life and vigour will be introduced. I have said nothing about thinning the Grapes, as this must be left to individual cultivators. Strong, vigorous Vines that bear large bunches will pay for thinning their fruit most certainly; but if done at all, it must be done in the early life of the berries, when the scissors can be worked easily and freely amongst them. Some people leave all the bunches that show on a Vine to grow; this is a great mistake, only one should be left on each shoot; the selection should be made as early as possible, and all weakly bunches not required should be removed.

Mildew and Sulphuring.—Vines in open air are not subject to so many diseases as when grown under glass. Mildew is the only thing that really causes any trouble, and this, if taken in time, may be easily dealt with. Sulphur is the best remedy, and recourse should be had to it as soon as the first white speck of the pest is seen. The sulphur may be applied in two ways, either mixed with water through the syringe, or dry in the shape of powder, being puffed on by one of those elastic distributors. The former is, I think, the best way of using it. Take a handful of sulphur, and mix it in a cup or some small vessel with water, and after the whole has been moistened, put it in a pail full of soft water; stir it well, and apply it with the syringe. But mildew does not often prove troublesome to a healthy vigorous Vine unless its wants have been neglected. Take, for instance, a border constructed in the manner I have laid down. If mildew ever attacks a Vine planted in it, it will be during a very dry season, and the Vine has been starved for want of water. Vines growing in a well-drained border require a good deal of water, and if it is not given to them they must seek it somewhere, and in their search for it they get into difficulties. Give plenty of water in dry weather with some liquid manure occasionally, and syringe the foliage three times a week in hot weather about four o'clock in the afternoon, using clean soft water that has stood in the sun some hours previously. It will be gathered from what I have written that I recommend, as regards the pruning and training, the rod system, with a very faint mixture of the spur incorporated with it, and this I have found the best. The rod system, of course, is simple enough; it is just cutting out a certain number, and training up a similar number of young canes every year. When I say I recommend a mixture of the spur with the rod system, I mean that any fruiting rod that produces strong plump well-ripened buds close to the main stem may safely be left to bear another crop, and have all the bearing shoots spurred back to two eyes.

VARIETIES FOR WALLS.—Black Cluster, Black July, Frontignan, Esperione, Sweetwater, Miller's Burgundy, and Royal Muscadine. If some one with plenty of south wall surface would get together all the early varieties of Grapes and test them thoroughly, so as to select three or four of the earliest and most suitable for general planting, a very great service would be rendered. At present Grape-growing in the open air is carried on without system, either in the selection of the varieties or their management. A hundred years ago better results were obtained, and I think one cause for this was because there was a better selection of varieties grown.

Grapes under Glass without Fire-heat.

Grape-culture under glass is a very large, many-sided question, but my intention now is only to briefly glance at one of its phases not commonly thought or written about, but which I think may be advanced and extended with advantage. With me this is no new question; I have often thought about it years ago, when the idea of covered farmyards was first broached. I thought the time would come when glass could be cheapened and strengthened; when improvements in roof-construction would do away with putty, and nearly with painting; when, in short, a glass roof would cost no more than one constructed in the ordinary way with tiles or slate, either to build or keep in repair. Still looking onwards in fancy, I saw the time approaching when Grapes might be grown by the ton for wine-making or consuming fresh, when every man, woman, and child, if they felt inclined, might try the Grape cure without going to France or Italy, but safe in our own dear old England. Paxton taught the architects how to cover in a large space cheaply with a system of small spans now called the ridge-and-furrow system, and with this plan a farmyard, or a range of cow-sheds, or cattle-stalls, or a stable-yard may be covered with a glass roof, and turned into an orchard-house infinitely superior to anything yet constructed. The small scale on which our glass-houses have hitherto been constructed have made them so liable to sudden changes of temperature, but a large space covered will possess a superior climate, suitable not only for Grapes, but also for Peaches, Apricots, and the choicer late Pears. A ridge-and-furrow roof will be supported with iron columns, and round the base of these the borders must be constructed, and the Vines and other fruit-trees planted fenced in, so that cattle cannot enter. With such orchard-houses scattered over the land, a threefold object will be secured, a desirable shelter will be obtained for the stock in winter and spring, the manure will not have all the ammonia washed out of it by the rains, and if only moderate results are obtained with the fruit-trees, the capital invested will pay a good dividend, and we shall be able to compete with foreigners at a time when the prices for everything rule high. I need not enlarge now upon the advantages the foliage will receive from the ammonia that is often floating in the atmosphere in the neighbourhood of a farmyard where many animals are kept, nor yet of the benefits that will accrue on a cold frosty morning in early spring when the Apricots, Peaches, and Pears are in blossom from the warmth of the animals' bodies snugly housed beneath the trees.

Of late years an attempt has been made in Wales to establish a Vineyard on the French system—such as no doubt existed in this country many years ago—but, whether it be possible or not to grow Grapes good enough for wine-making in the open air without any shelter, there can be no doubt that they might be grown in immense quantities by utilizing farm-buildings for their culture. If my memory serves me rightly, there was a large cow-house covered with rough plate-glass in Wales in which good Grapes were grown some years ago, and Apricots have been produced of good quality in a cart-shed covered with a glass roof. That fruit-culture can be profitably carried out in some such ways I feel certain; in fact, I should expect to see better Grapes, finer Peaches, Apricots and Pears produced in large roomy glass-covered yards than in the more costly structures in gardens. There can be little doubt that plants do take in nourishment through their foliage, and it will be a good step in advance when we extract the ammonia that taints the atmosphere in the neighbourhood of our farmyards and convert it on the spot into Grapes and other fruits, at the same time utilizing the heat accumulated to force them forward. A gardener, in even the best situations, often has a hard struggle to get fresh soil for his Vine and other fruit-tree borders, as well as manures, both liquid and solid, but a farmer will have no such trouble; everything he may require will be at his elbow, ready for use.

Well-ventilated glass-covered spaces will give us a climate like that of the South of France and the Channel Islands, and we shall be able to compete with the former in regard to Apricots, Green Gage Plums, &c., and with the latter in Grapes and Pears. A crop of good winter Pears will, perhaps, be more valuable than Grapes, but there is plenty of choice.

What a Rosary one of those glass-covered yards would make. Only fancy a yard 30 ft. or 40 ft. square, or even larger, covered with a glass roof, with Tea and Noisette Roses planted round the sides, and led upwards till they meet under the glass. What a pleasure it would be to look up at the drooping buds growing in the wildest luxuriance, and, above all, think of their value in the market. Some may think I am building castles in the air, but things are being accomplished every day that are far less feasible. To build in the old-fashioned way, however, will not do. We must have a roof that can be cheaply erected, and that will last for years without much cost for repairs. There must be no putty employed, and no perishable substance exposed to the weather to require outside painting. This can now be secured by more than one system of glazing, and no doubt improvements will be effected in accordance with the demand.

In furnishing yards or buildings of any kind with Grape Vines the borders may be under the paths or else outside altogether, and the Vines introduced at the corners. Four Vines will cover a very large space in a few years, and the extension system is the right one to adopt in such cases. The Black Hamburgh, the Sweetwater, and Muscadine will be the best kinds to plant. Apricots, Plums, Cherries, and Pears will also grow rapidly in such buildings, and should be allowed plenty of space. Standard trees one or two years trained will be best.

PEARS FOR PLANTING UNDER GLASS.—Bergamot d'Esperen, Beurré d'Anjou, Beurré d'Aremberg, Beurré Diel, Beurré Rance, Easter Beurré, Winter Crassane, Pitmaston Duchesse d'Angoulême, General Todtleben, Glou Morceau, Victoria (Huyshe's), Joséphine de Malines, Ne Plus Meuris, Winter Nelis, Chaumontel, and Zéphirin Grégoire.

PLUMS FOR PLANTING UNDER GLASS. — Coe's

Golden Drop, Goliath, Green Gage, Huling's Superb, Kirke's Blue, Jefferson, Transparent Gage and Washington.

APRICOTS.—Moorpark, Peach and Royal.

CHERRIES.—Governor Wood, May Duke, Royal Duke, Frogmore Early Bigarreau and Black Tartarian.

PEACHES.—Early York, Hales' Early, Crawford's Early, Royal George, Noblesse, Walburton Admirable and Prince of Wales.

NECTARINES.—Balgowan, Downton, Elruge, Pineapple, Violette Hâtive and Pitmaston Orange.

GRAPES.—Black Hamburgh, Foster's Seedling White Muscadine, Sweetwater and Esperione.

FORMATION OF AN ORCHARD.

Success in fruit-culture is principally a question of soil and shelter, and if the first is fairly suitable, and the latter either present or capable of being supplied, success, under fairly good management, will in general be the result. The districts in which fruit-trees seem most healthy and fertile are, as a rule, undulated, and it is from the sunny slopes, avoiding the bottom lands, the best crops are obtained. A planter with large means and resources should select a site for his orchard on some gentle declivity sheltered from the prevailing winds. In such a position he may plant largely, for spring frosts will be less hurtful than elsewhere, owing to the cold air rolling down into the valleys leaving the hillsides free from its baneful effects. For all plantations of fruit-trees, shelter, as I have said, is most important; so much so, indeed, that where it does not exist it will pay to create it, especially if the area of land to be planted is considerable. Belts or groups of Hazel and Larch, with a few Oaks or other trees of permanent character intermixed to form the future grove, will be both useful and ornamental if rightly designed and properly carried out; but the sheltering groups should not be placed too near the fruit-trees. Not less than 50 or 80 yards should intervene to separate them, as a fruit-tree, no matter how well developed, stands no chance in competition with an Oak or Elm ; not only will the roots of the latter spread so as to rob the fruit-trees, but the numberless leaves of large spreading trees, when too near, influence the temperature and otherwise render the situation less suitable than it otherwise would be. Ash-trees should never be planted or be permitted to grow near fruit trees, as their roots spread so far and impoverish the soil so much more than those of most other trees do. It is true I have seen Apples and other fruit-trees flourishing in belts and shrubberies and in the outskirts of woods, but there were no very large trees near them. So long as the fruit-trees can have light and air on all sides, no great harm will be done. But much more might be effected in regard to fruit-culture than there is without going to the expense of creating new plantations for shelter. Any one with a knowledge of the subject, and who has given much thought to it, will have no difficulty in pointing out plenty of warm snug corners on every estate and on almost every farm where it would pay to plant fruit-trees—some gently rising knoll in the corner of a field, it may be, sheltered by hills, hedges, or coppices. Such a position may not afford space enough for a large orchard, but supposing one of those sheltered nooks is capable of holding, when planted, one dozen or two dozen of Apple, Pear, or Plum-trees, if the ground be well prepared and the planting well done, the trees will soon add immensely to the value of the land. It may be said that fruit-trees, planted in positions away from a dwelling, would have their produce *stolen,* and so perhaps it might, if only a few trees were planted, but not if the matter be taken up generally. If every one who has a suitable site and is desirous of improving his property would plant fruit-trees, the novelty of such plantations would wear off and fruit would be so plentiful that even if a few were taken they would not be missed. If a person plants an orchard at present he seldom or never takes into consideration the question of shelter. It is customary to plant the orchard near the dwelling, and so there it must be, although probably the house may stand at the bottom of a hill where hoar-frost lies thickly in spring, while the higher ground is free from it. I grant it is a pleasant sight in spring to see a village farmhouse or cottage embowered with fruit-trees, and, when the village stands half-way up the slope, such a position is suitable enough; but the risk of destruction when the trees are planted in the bottoms of the valleys is, as I have shown, far greater than when the situation is higher. It is a well-known fact that plants of a tender character will survive on a hillside while in the valleys they are cut down. Of this Potatoes furnish in spring plenty of evidence. Groups or groves of Apples, Pears and Plums may be set down in corners of either arable or grass fields, and, if none but tall standards are used, no additional fence will be required. Of course, a fruit-tree must be guarded from sheep and stock, but otherwise the field that has been cultivated may be cultivated still, only the trees should be planted at rather wider intervals—say, from 24 ft. to 30 ft., and the same thing may be done in the case of grass-land. In both instances the land should be trenched or ploughed as deeply as it will bear, and the grass-land should be fenced for two or three years with hurdles, as young trees grow faster where the surface is cultivated than when it is immediately laid down to grass. I consider shelter to be even more important than good soil, for I have seen good fruit grown on inferior soil well sheltered; but good soil will not always suffice to insure a crop when much exposed to cold winds. A good depth of loam over clay, red sandstone, or, indeed, almost any kind of subsoil, will grow good fruit. Half the old fruit-trees in the country are perishing either from want of drainage or from poverty, having long ago consumed all food within their reach.

Importance of Draining.—Assuming, therefore, that there is from 20 in. to 3 ft. of good workable fertile soil resting an a dry bottom, or one capable of being drained, fruit-trees ought to thrive; good drainage is imperative, for in a wet soil fruit-trees soon become covered with lichen and moss. It may be taken for granted, if the loam is of a heavy adhesive character, that for fruit-culture it will be the better for draining. The plants on such land may at the same time suffer from drought in summer, and yet the land be too wet in winter for the roots of trees. Draining not only lays land drier in winter, but it also, when followed, as it ought to be, by deeper and better cultivation, makes it support whatever is growing on it better in dry weather. Land that is well prepared by deep cultivation cannot be overdrained, as the deep working and intermixing prevents cracking and makes it more retentive of moisture—that is, it checks evaporation, and I need not say it is far better for any crop to have the surplus moisture pass through to the drains than have it lifted by evaporation from the surface. Any complaint made of land being injured by draining is a sure sign that the surface only has been worked. Draining, unless followed up by better culture, may do harm. Some years ago I was shown a grass field that was said, and rightly too, to have been injured by draining. The field had formerly produced heavy crops of rough, coarse herbage, which, after the land was drained, became lighter from the rushes and coarser grasses dying out. Had the surface been scarified and well manured, and a renovating mixture of seeds sown, the field would have been permanently improved, and would have supported stock better than it had ever done previously. Draining is only one item in the improvement of land, but it opens the way for and renders others possible. For draining orchards or fruit-gardens the pipes used should not be less than 3 in. in diameter, and the mains proportionately larger, in order to insure a rapid clearance of water in winter. The drains should not be less than 4 ft. deep; the distance apart at which they should be placed will vary according to the character of the soil, and if 3 in. or 4 in. of stones can be laid over the pipes before the earth is filled greater efficiency will be the result. Brushwood will have a somewhat similar, though less permanent, effect than stones.

Preparing the Site and Planting.—After the draining is done the land should be well broken up; too many in planting orchards are content to dig a hole and stick the roots of the tree in it. For deepening and intermixing the land the spade is the best implement; but where planting is done on a large scale, the plough and cultivator would probably effect a saving, and if steam can be employed for smashing the soil up so much the better. Few seem to realize how great is the necessity for deep and thorough tillage for fruit-trees; many think they have done all that the case requires when they have broken up the ground for 1 ft. or 2 ft. in immediate contact with the roots. Now, I am convinced one of the chief lessons we all have to learn is to take more pains in preparing the site which orchards are to occupy. Just consider the length of time, if all goes well, the trees will have to grow on it. How is it possible for young trees moved from the deeply-cultivated nursery? [Nurserymen understand their interest too well to grow trees in shallow, unworked soil], and rammed into a hole barely large enough to contain their mutilated roots to flourish, and yet that is the way in which many orchards have been and are still planted. No doubt we rightly at times complain of our climate and the difficulties attending bad seasons. But depend upon it the trees in thousands of instances do not have a fair chance to work up strength of constitution to enable them to resist unfavourable climatic influences. If fruit-trees are to flourish and reach a good old age, and at the same time perform the work expected of them, they must have a better start than is often given them in field-culture. When the land is well broken up and intermixed, the moisture and temperature are more equable than when the trees are planted in holes, no matter how large they may be. There are, of course, cases in which fruit-trees are planted on old pasture land, where the objections to its being broken up would be insuperable; then the holes should be made not less than 6 ft. in diameter. Planting trees in holes in land that has not been moved is only an enlarged system of pot-culture, and as a larger and better tree can be grown in a large pot than a small one, so on the same principle the hole in which a fruit-tree is planted should be as large as possible, if the ground cannot be all broken up. In large orchards of mixed fruits, the Apples, being the hardiest trees and the latest bloomers, should be planted on the windward side, so as to shelter their earlier-blooming neighbours; then should come the Pears and Plums, and lastly the Cherries. Apple-trees in sheltered hedgerows often bear a crop of fruit when those in the orchard are bare; and where the hedges are kept in good order, I do not think *there is any* valid objection to their being so planted.

Put in the fruit-trees when the young Thorns are planted, so that both may grow up together. The advantage of planting trees in such situations, apart from their picturesque effect, is their being effectually guarded from stock, and, as the site of the hedge either is or should be well prepared, the young trees generally do better than when planted in orchards. There is so little expense in the case of hedgerow trees, that I think something more might be done than there is in that way. It would hardly be wise to plant in hedges by the roadside, but in those that separate fields from each other, and that, perhaps, may be in view of the house, Apple and Plum-trees would not only be profitable, but add to the landscape effect.

THE APPLE.

Standards.—The Apple is one of the most important fruits which we possess, and although there are certain districts in which the trees flourish better and attain larger proportions than in others, yet it may be and is grown with a fair amount of success in most parts of the country. I have met with orchards in counties not celebrated for their fruit-culture where the trees have been as large and as fertile as in the best parts of Worcestershire or Herefordshire, simply because the planter had selected a good site where the soil was suitable and the shelter good. Apples should have a soil not less than 20 in. deep, though, of course, the best results will always be obtained on the best land. Standard trees, on clean healthy stems 6 ft. high, are best for orchards to which sheep or cattle have access. For reasons already stated, the trees will thrive best if the whole of the land has been deeply stirred some months previous to planting, which should be done in autumn, not later than November, if possible.

For the first few years the ground between the trees should be cropped with Potatoes or something that necessitates frequent stirring early in summer in order to let in solar warmth to encourage healthy root action. When the trees have made a good start grass seeds may be sown, but the stems must be protected before sheep get amongst them, and if cattle have access a good substantial guard should be erected round each tree; but I think it a mistake to at any time let cattle browse in orchards, as they are constantly injuring the lower branches. There is not the same objection to sheep, as the stems can be guarded in a cheap and simple manner, either by tying thorns round them for 3 ft. or 4 ft. up, or, what is better, make protections, with deal laths, in the following manner: Procure a number of 4-ft. builder's laths and a ball or hank of rope-yarn. Cut the rope-yarn into pieces about 2 ft. long or so; select a lath and tie a piece of the yarn round each end and another piece in the middle, making the knot in each case on the same side, and leaving the ends of the yarn of equal length when the tie is made. Then take another lathe, place its edge against the knots in the strings, pass the ends round the lath, and secure it by a knot at the opposite edge, and so on, adding as many laths as will be necessary to reach round the stem of the tree, leaving room for growth. A number of these screens could be made in a short time by two people, and neither sheep nor rabbits could injure the trees so long as the protections continued in good condition, which they would do for several years. It will be obvious that if Apple-trees are planted on good land, simply breaking it up deeply after the draining and fencing has been done will be sufficient, and no one would plant extensively on any but suitable land. For purposes of home supply, however, some may desire to form a small orchard where the subsoil is not exactly suitable.

In the latter case the bad subsoil should be taken out, carted away, and better soil substituted. Or it may often happen (where expense is no object and where horses and carts are at hand) that an unsightly bank may be removed and spread over the intended site of the orchard to the depth of 2 ft. without any disturbance of the land covered beyond digging it over, and so an excellent bed be made for the trees.

Selection of the Trees is an important matter. For orchard-planting they should be grafted on the Crab, and none but those with straight, stout stems, free from all canker or blemish, should be planted. The sooner they are planted after they are received the better, and all planting should be done a month before Christmas, if possible. At any rate, the selection should be made early in autumn; even if they cannot be planted at once, the roots should be trimmed and laid in by the heels. Such trees usually do better, and become established quicker than those brought home after Christmas, even if planted directly they arrive. The reason is the wounds are healed, and new roots soon spring from the places to which they were pruned back. Moreover, as in nurseries the principle of first come first served is observed, those who buy their trees in autumn have the pick if they like to take the trouble to select what they buy. Fruit-trees should never be allowed to lie about with their roots exposed. Many a young tree has a hard struggle for existence from this cause, and the employés in nurseries are not always free from blame as regards this matter. A sharp knife should be used to trim the wounded parts, making the cuts as short as possible. In planting the roots should be spread carefully out and be covered with mellow soil, care being taken not to bury the collar of the tree too deeply. The depth at which it was planted previously will be some guide in regard to this matter. If the soil is fairly dry the feet may be used to press it firmly round the roots, and the tree should at once be staked. The part of the stem that comes in contact with the latter should be secured from injury by placing some soft material between it and the stake. Mulch over the roots with some half-decayed stable manure. If the land be fairly good no manure need be used when planting, but it should be manured well between the trees so long as it remains in cultivation, and even afterwards it should be kept in good heart. It should not be forgotten that the soil of orchards on grass is bearing a double load, and should receive liberal treatment. Simply allowing a few sheep to graze, which is generally all the manure it receives, is not sufficient. Tall standards should be planted at distances varying from 18 ft., in the case of moderate growers, up to 24 ft., in that of more vigorous kinds. In this matter, however, no hard or fast lines should be observed, as it is best to vary the distances according to the quality of the soil. Standards with stout straight stems 6 ft. high, rearing their heads aloft and spreading well out on all sides, are most profitable trees for large plantations; but they represent only one phase of Apple-culture, though a most important and profitable one.

Dwarf Trees on the Crab, or the free stock, and also on the Paradise, have their uses in a country so variable in its soil as that of England. The planter of an orchard of tall standards will, if he lives long enough, have a valuable property if the work be well done and the right kinds planted, but he cannot expect to reap any immediate profit from it; he must wait patiently for the result. But those who plant dwarfs on the Paradise may eat of the fruit of their trees in a short time, and this will have weight with some; besides, small trees may be planted where tall ones would not answer. I cannot conceive a position unfitted, with a moderate amount of labour, for Apples on the Paradise, and this forms their chief value, their adaptability for-inferior situations for which large spreading trees would be unsuitable. Of course the Paradise is best fitted for small gardens, where they should either be planted in beds or groups from 4 ft. to 5 ft. apart, or on borders especially reserved for them near the paths, but in either case nothing should be planted over their roots, and the surface of the soil, as far as their roots extend, should be mulched with manure in summer in order to retain moisture, as the Paradise is a moisture-loving stock, and, owing to its fibry surface-rooting character, it cannot easily run down for moisture, and hence the importance of the mulching. This stock has doubtless been condemned in many instances because it would not submit to the rough treatment of digging and delving about its roots, an operation to which Apple-trees in gardens are usually subjected. I hope the time is coming when fruit-trees will be considered of sufficient importance to have a compartment to themselves, and not, as now, have to struggle for existence amongst other crops whose necessities compel the cultivator to dig amongst them, driving their roots downwards in self-defence. Dwarf Apple-trees, on the free stock or the seedling Crab, will make large spreading trees and bear a great quantity of fruit. There are some advantages in planting such trees, especially in windy situations, as, being dwarf, the wind does less injury to the blossoms in spring than it otherwise would do, and there is not so much of the produce blown down prematurely in autumn. In large fruit-growing establishments there is room for all the various forms of training, and it is a decided advantage to have them all, for I have known seasons in which, when standard trees in the orchard were bare of fruit, dwarfs in the garden were well cropped, and *vice versâ.* It is simply having two or three strings to one's bow instead of one. Dwarf trees, being in a measure restricted in growth, require, however, more attention and care. They should, in fact, be kept well in hand. And to this end, if the subsoil is unsuitable, no matter whether it be hungry gravel or cold plastic clay, some means should be taken to render the bottom impervious to their roots; except this is done, the roots will, the first dry summer, unless the surface is heavily mulched, run down in search of moisture, and the system of the tree will become disorganized. There are various ways of keeping the roots out of a bad subsoil, such as paving with stones or bricks laid in cement, 4 in. or 5 in. in thickness of concrete laid over the bottom of the station, broken stones to the depth of 6 in., with a mixture of fresh lime and ashes watered in and rammed down firmly, answer the purpose. In short, whatever can be most readily obtained in the neighbourhood should be used. In extreme cases the trees may be planted a little above the surface on slightly raised mounds; but the objection to this is they are apt to suffer in dry seasons from drought, and if the land has been drained there should be no necessity for it. There is still another system of training Apple-trees which, though old-fashioned, is yet excellent, and that is the espalier. For the production of regular crops of handsome high-coloured fruit, I know no system of training equal to it. The trees are at all times immediately under the eye; a single glance tells when the finger and thumb or the pruning knife requires to be called into requisition. I grant, however, that as regards these there must be a considerable outlay at first. A stout wire fence costs money, but when once erected it will last many years if kept painted. Espaliers are commonly trained from 4 ft. to 5 ft. high, but there is no reason why they should not be more than 5 ft. high, as the space upwards costs nothing. In large gardens 6 ft. or 7 ft. is none too high. The wires should be about 10 in. apart, and the same distance from the ground, as the fruits on the bottom branches when near the ground are deficient in colour and often splashed with earth. Dwarf trees on the Crab will require spaces of from 18 ft. to 24 ft. Such trees in good land make fine large heads, and it is a mistake where the soil suits them to adopt any dwarfing system of treatment. Espaliers also should have plenty of room allowed them. From 16 ft. to 20 ft. will not be too much, and in some cases vigorous growers may have more.

Training.—As regards orchard trees, the best shape is the natural one, which in most varieties is a round, branching head, somewhat inclining to the conical form; and the object of the pruner in the early career of the tree should be to create a well-balanced head, with special regard to the natural habit of growth. If the right means be adopted, it is as easy, without any undue use of the knife, to secure handsome trees, as it is to spoil them. Supposing the cultivator has arranged in his own mind the kind of tree he wants, the head must be cut back more or less in order to secure a sufficient number of branches to lay the foundation. If the trees were maidens—that is, one year from the graft—they should be cut back to four or five buds; if two years worked, they would, as a matter of course, have been cut back the previous year in the nursery. The only object of cutting back a young tree is to secure a foundation; and the moment that object has been obtained, hard pruning should cease, and should be confined to thinning out badly placed and weakly shoots. The proper time to cut back young trees is in spring following the planting—that is, if the planting has been done in November, as it should have been. When the sap begins to rise is the best time to prune, cutting back to a bud pointing in the direction the branch should take. After the trees are fairly established no leading shoot should be cut back unless some special cause demands it. Though the attention which standard trees require is not much, yet what little is necessary should be afforded them annually, always bearing in mind that cutting out a small branch does not leave so large a wound, and has a less disturbing effect upon the forces of the tree than removing a large one. The main object of both pruning and training should be so to regulate growth that every part of the tree shall have its due share of air and sunlight. Whenever it is necessary to cut back a tree to obtain a better-furnished base, the operation should be performed in March, and when the buds break, thin out the badly placed growths and those that will push in excess of what may be needed from the point where the branch or branches were severed. As regards dwarf trees on Crabs or free stocks, such as are commonly planted in kitchen gardens, they too must be cut back more or less to secure a well-balanced tree. A careful pruner will make handsome specimens simply by cutting to a bud pointing in the direction the branch is required to take. But if great exactitude of training is necessary, some mechanical means must be adopted. A hoop placed in the centre, and the branches tied to it at equal distances apart, is one way, or stakes may be employed to lead the young shoots in the right direction. For all practical purposes, however, the knife intelligently used will suffice. Apple-trees on the Paradise stock require but little pruning, and that little should be mostly done in summer, and should consist mainly of thinning the young shoots where too thick, or by *stopping one* that seems making an effort to obtain more than its share of the sap, and so taking the first step for destroying the balance of the tree. The pruning and training of espaliers is a simple matter. If maidens—trees one year grafted—are planted, they must be headed back to the bottom wire. If trees one year trained are selected, they will have one pair of shoots which should be tied to the bottom wire. The central leader should be pruned back to the second wire, at which point a couple of shoots should be selected the next year to occupy that wire, whilst the leader will be advanced a stage to the third wire, and so on till the trellis is furnished. The leading shoots should not be shortened till they meet their neighbours on each side, when of course they must be stopped. Horizontal training is well adapted for Apples and Pears, and these fruits are especially suitable for training on espaliers.

Summer Pruning.—I do not think the importance of summer pruning and the advantages which it confers when moderately and rightly done are sufficiently appreciated, except by good cultivators. Some do not prune at all in summer, but cut back all the summer shoots in winter, and then complain that their trees are fruitless, and are obliged to resort to root-pruning to restore their fertility, which indeed ought not to have been suffered to depart. Others take quite an opposite course, pinch and cut every bit of green shoot back to so many leaves as soon as they are made—in fact, scarcely permit the trees to make any progress at all. Trained trees, in order to keep them within their allotted space, must submit to a certain amount of pruning, and summer is the proper time in which to do it. When a tree is permitted to make all the growth it can in summer unchecked, and that growth is pruned off in winter, a very few years will destroy its balance and make it fruitless, when nothing but pruning its roots can put matters right again. But the opposite course of constantly nibbling at a tree all summer is even worse, for it results finally in the tree being crippled or worn out. When a tree ceases to make, or is prevented from making, a reasonable annual growth, the vital principle is weakened, and it is unable to bear fully developed fruit, and ultimately it dies from exhaustion. The leaves are the most important organs which plants possess; without them there would be no flowers or fruit, and no advance at all in growth. They elaborate the sap, which is pumped up from the roots in a crude state, and though it is necessary they should be present in sufficient numbers to carry on such work, yet if they are too numerous—if each cannot have its fair share of light and air—then action is impeded, and the work is ill done. One good stout leathery leaf is worth more than two or three thin weakly ones for the particular duties which leaves have to perform. Then it must be borne in mind that not only does each leaf perform, in conjunction with its fellows, the combined work required by the tree, but it has also a special duty assigned it—that of catering for its own particular bud, which is snugly situated at its base, and which may perhaps be developed into a truss of flowers if properly matured. Permit a tree to carry all the leaves upon which the sun can shine and it will be well with that tree, but let that limit be much exceeded and something must go wrong. If the leaves crowd each other the result is all are injured and weakened, and the buds in the reaction which will take place will lose form, and, instead of producing blossoms and fruit, develop only in the shape of leaves and soft young spray; therefore, instead of saying pinch or cut to so many leaves, I say keep the growth thin in summer; let sunshine stream in *upon every leaf*, which should be allowed to feel the motion of the air, but at the same time do not over-pinch. Leave the tree sufficient force to carry on the work, and do not be in too great a hurry in spring; let it just feel the impetus of the rising sap before before a check is given.

Winter Pruning.—It has never yet appeared clear to me that winter is the best time to prune fruit-trees, so far as the trees themselves are concerned. I am thinking more especially of the thinning of orchard trees when necessary. There would be, I think, some advantages in doing the work in summer, as when the leaves are on the trees one has a better guide as to the amount of thinning required. Of course the work could not be done when the trees were loaded with fruit, but advantage might be taken of a fruitless season, or the pruning might be done in autumn, after the fruit is gathered, but before the leaves fall. However, pruning in winter, when other matters are less pressing, answers fairly well. In pruning orchard trees where thick branches have to be cut out, they should be cut close up to the main branch, and the wound smoothed with a knife, and left in such a manner that no water can lodge on the wounded surface; but it is only where trees have been neglected that large branches will require removal, unless in the case of old trees. In pruning, the outside branches should be thinned, to give the sun a chance to reach the interior, so that the fruit may be equally dispersed, and not all found at the extremities of the branches only. As regards trained trees, both dwarfs and espaliers, when the summer pruning has been properly carried out, there will not be much to do in winter. The spurs left by the summer pruner must be shortened, and if too thick some may require cutting clean away; the same thing may happen with respect to a few old spurs here and there if too thickly placed. Of course, all dead snags must be cut clean out, and the leaders, in the case of trees that have reached full size, should be shortened back.

Root-Lifting and Pruning.—I believe it to be impossible for a tree with its roots deep in the ground to be fertile. The more one thinks and studies the matter over, the more is one struck with the simple, but beautiful, manner in which all things pertaining to the vegetable kingdom are arranged. We see a tree, by injudicious pruning, producing a larger leaf-surface than is necessary or desirable to meet the steady requirements of fertility when confined to a circumscribed space. The usual result follows; one error leads to others, until the whole system of the tree is out of order. In the foliage of the tree the cultivator has the key to its well-being; it gives him, in fact, absolute control over all the other portions if he knows how to use it. It is the leaves that apply the stimulus to the roots in spring; and when the days lengthen and strong light and warmth increase, the evaporation from their surface is greatly increased; the messages they send down to the roots become more urgent, and, thus pressed, the roots rush down deeper and deeper to find the water which the leaves are so wantonly dissipating. I have thus briefly endeavoured to describe the chain of circumstances that usually leads to the necessity for root-pruning. If the roots, or a good portion of them, could be kept near the surface, there would be no need for pruning them, but when once they are down they must either be lifted to the surface, or be cut off. There is no doubt, I think, that root-lifting is better than root-pruning when it can be carried out, and it can be in the case of all young trees, or trees not too large to transplant. In lifting or transplanting a tree always begin far enough away from the stem; nothing is worse than working *in too small* a space. Let the operator give himself room to strike out, and the work will be done both better and quicker. The roots of a tree that is too large to transplant may be lifted by instalments, so to say—half one year and half the next. It takes up more time than simply cutting the roots off, but its effects are better, as it brings the roots up and makes them assume the desired direction; whereas cutting them off simply checks, but does not alter, their downward course, unless they are cut near their source, and that implies a risk of crippling the tree. The majority of root-pruners simply open a trench from 3 ft. to 4 ft. from the trunk of the tree, according to its age and size. The trench is driven down till it gets below the roots, and is turned inwards towards the tree to undermine and cut the tap-roots, which descend perpendicularly. As a rule, half round the tree will give quite check enough for one year. The other half can be pruned the first or second year following. If the tree is old, and the soil more or less exhausted, much good will be done by bringing fresh soil to fill up the trench, scattering the old soil over the vegetable quarters. The new soil will encourage the roots of the tree to ramify and fibre out nearer home, so to speak, than hitherto. I have root-pruned fruit-trees in summer, and if done carefully it answers well and a season is gained; but in October, after growth has ceased and the wood is firm, is the best time for those who have not made the subject a special study. There is then still sufficient action in the foliage to cause new roots to break out before winter sets in.

Renovating Old Trees.—All things come to an end, and to this rule Apple-trees form no exception. They are, however, often condemned whilst there is yet a long period of useful, vigorous life in them if properly treated. If a tree be sound at the heart, the moss-grown trunk and limbs can be scarified and dressed with quicklime, that will kill the moss and renew the bark. At the same time the dense thicket of branches can be thinned to let in the sunshine, the exhausted earth taken from over the roots, and a good thick coat of rich manure added. But it must not come into contact with the roots. Exhausted trees need at times a strong stimulant to recuperate them after years of hard work, during which time everything the trees have borne, even to the leaves, has been taken away, and nothing brought back in exchange. Poverty in the soil is certainly a chief cause of decrepitude and barrenness, and the fruit that trees in such a condition bear even in a good season partakes of the scrubby, blotched, worn-out character of the tree. The average length of life of people, both in town and country, is advancing in consequence of their getting better food and having improved sanitary arrangements, and the same result would follow in the case of fruit-trees if their wants were better attended to than they now are. In the renovation of old trees, the first thing to be done is, as I have said, to thin out the wood, so that the sun can look in and dry up the green slimy moss that in many cases covers the branches. Other benefits will also follow, such as better foliage, stronger wood, and cleaner and healthier fruit. But this thinning or pruning must not be done rashly; only some of the most badly-placed branches should be cut out the first year. Newly-slaked lime should be sprinkled freely among the smaller shoots when they are damp; to the trunk and main branches it might be applied with a brush in a thick, semi-fluid state, and after the head has been trimmed and dressed the roots should be bared and their wants supplied in the way already indicated. More thinning might be given to the branches the second year, and a little annually afterwards will keep matters right; the lime dressing might also be repeated if necessary.

Moss on fruit-trees is sometimes an indication of too much moisture in the land, and a consequent necessity for drainage. This should be ascertained and the defect remedied. I have sometimes seen old Apple-trees restored to vigour by cutting off their heads and allowing them to break again right away from the trunk. This remedy is generally speedy in its action—it either kills or cures. If the tree is sound and not too old it will shoot afresh with great vigour and become like a young tree again, but if not it quickly dies. There are, however, thousands of useless old trees in the country that might with advantage be put to this test, as the loss would not be great if they died. Young fruit-trees should never be planted on the site from which old ones have been removed.

Thinning the Fruit and Mulching.—Few people attempt to thin Apples; indeed it would hardly be possible to do so in the case of large orchard trees. The consequence is whenever a really favourable season comes, and every Apple that sets remains to swell, the fruit is not only inferior in quality, but the trees are frequently seriously injured. Sometimes when dry weather sets in the crops get naturally thinned, and even when this does not happen, though it might not be possible to thin the fruit, it would not be much trouble to mulch the trees. This might be done even with trees on grass; a good dressing of rotten manure spread under the trees, nearly as far as the branches extend, would be of immense benefit, and dry weather should not be waited for; on the contrary, let every tree carrying a heavy load be mulched by the end of June or beginning of July. The manure would not injure the grass, as it would soon mellow down, the grass would grow through it, and the manure or the essence of it would be washed down to the roots and help to keep up the stamina of the tree at a time when some extra support was much needed. The fruit on all trained trees might, indeed should, be thinned whenever the crop is too heavy. This (if regularly attended to) would be one means of maintaining the trees in a constantly fertile condition. In thinning, the smaller and inferior fruits only should be removed, and the best time to perform the operation would be, in average seasons, about the end of June or beginning of July. The mulching should under no circumstances be neglected, as it not only benefits the present crop, but helps to keep the feeding-roots near the surface, and this is a matter of primary importance.

Stocks and Grafting.—The best stock for orchard or other trees that have plenty of space for development is undoubtedly the Crab, and for weakly-growing Apples the stock should be run up standard high before they are grafted, as this insures a strong stem, and gives increased vigour to the head. The free stocks obtained from Apple-pips are also largely used in nurseries, and as they vary much in strength the strongest are generally selected for standards, the second size for espaliers and dwarfs, and the smallest of all are often used as dwarfing stocks, and have, in a measure, the same effect upon the Apples grafted upon them as the Paradise stock. The selection of proper stocks, however, requires great practical experience; but one thing may be positively stated—viz., that a strong stock does infuse vigour into a tree, and that a weak one, with a tendency to make roots near the surface, does induce early fertility with less freedom of growth. The Paradise, so called from its real or supposed origin in Armenia, is a low, dense bush, readily increased by cuttings or layers, and for some situations it is a valuable stock, especially in cold, ungenial places where Apples on the ordinary stock do not thrive. It forms an excellent stock for pot-culture, and though some, who live in districts where the Apple-tree assumes giant proportions, may be amused with the idea of growing Apple-trees in pots, yet it is not so absurd after all, if they cannot be obtained in any other way, and the fruit from these little trees, when well fed, is always fine in quality. A hundred of them might during the time of blossoming and setting be placed in a very small house, and after all chances of frost were gone a good part of them might be plunged outside in some sunny corner to develop and ripen their fruit. There will always be those amongst us who would rather eat fruit of their own growth than buy it, even if purchasing was the most economical plan, and Apple-trees in pots enable the dweller in the bleakest and most ungenial situations to accomplish his desire. Then imagine the display which these little trees make when in flower; even the camellia itself scarcely rivals them. Of course no one expects these little dwarf trees to be so long-lived as if they were grafted on a stronger, deeper-rooted stock.

Whip-Grafting.—There are many different modes of grafting, but only two need be mentioned here, as they supply all that is needful in ordinary cultivation for the propagation of fruit-trees in this country. What is termed "whip-grafting" is the method commonly adopted in nurseries. It is so simple that any one with a sharp knife can soon learn to do it sufficiently well to insure a good union, and dexterity will come with practice. In nurseries most of the fruit-trees are grafted near the ground; the stocks are headed down by an oblique cut; a slice is cut off one side; the scion is cut in a corresponding manner, so that at least the inner bark of one side of the scion can be joined to and meet the inner bark of the stock; without this there will be no union. Tonguing is commonly adopted with whip-grafting; a downward cut is made in the stock, a thin slice is taken out, and a similar cut is made in the scion, so that when the two are brought together the tongue or lip of the scion just fits into the incision made in the face of the stock. If neatly executed it may perhaps add to the chances of the graft growing, but it takes time, and well-fitted grafts will grow without tonguing. When Apples are grafted low down and well tied in with soft matting, if a ridge of earth be raised on each side, so as to cover the point of junction well up and keep the air from the wounded parts, there will be no necessity to use either clay or wax. If the air be kept from the part operated on it matters not how it be done; and a ridge of earth raised along the rows answers admirably. Of course the grafts should be tied in and the earth raised at once—*i.e.*, as soon as the grafting is done, and if much has to be done, the two operations should go on together.

Crown or Rind-Grafting.—The other kind of grafting to which allusion has been made is called crown or rind-grafting, and is only adapted for large trees. It is the simplest and most certain method of grafting with which I am acquainted. Supposing we wish to put a new and better head on a large tree, we cut the branches off within a short distance of the trunk, make the cut horizontally, trim its face smooth with a sharp knife, and put in two or more grafts, according to the size of the stem. It is a good plan to put in enough, as if too many grow it is easy to thin them out. Insert the grafts by making an upward cut in the bark about 3 in. long and just through it. The grafts are prepared by cutting a slice off one side tapering to the bottom; the outer bark of the other side is then removed with a light and delicate hand, leaving the cambium or inner bark to unite with that of the stock. When the graft is prepared, an ivory or bone skewer, in shape like the bottom of the scion, is inserted close to the wood in the inner ring of bark, and as soon as it is withdrawn the scion is immediately inserted and pushed firmly down with its flat side to the stock. The grafts should be tied in and immediately well coated with clay, which must be looked to occasionally, and all cracks filled up till the scions begin to grow, and when growth fairly sets in the ties will require loosening, and later in the season they should be removed, but, if soft matting be used, no injury will arise if left on till the weather destroys it. As the young shoots of the grafts make progress, a small stake should be placed to each to prevent wind blowing them out, which sometimes happens, especially in the case of rind-grafting. Most of the success of grafting depends upon doing it at the right time, and both stock and scion should be in proper condition for rendering the operation satisfactory. The scion should be in a dormant state, and to this end the young shoots forming the scions should have been cut off and laid in moist earth in a cool place several weeks beforehand. In grafting we commonly use young wood, but older wood, so long as it did not exceed the stock in thickness, would do equally well. The buds of the stock should be just bursting into growth when the grafts are put on, and in the case of old trees a little more time may be permitted. In planting fruit-trees extensively in any given district, some, no matter how good their character may be elsewhere, will generally be found unsuitable and worthless, but by heading them back and grafting them, in two years they will be converted into valuable trees, while by digging up and planting new ones more than double that time would be consumed before fertile trees could be obtained. Those, too, who have only a limited number of trees can, if they like, have several sorts of Apples or Pears on one tree. I have, in the case of large trees, seen quite a collection of Pears on one tree. However, this is not so much to be desired, as if more than one or two kinds are worked on one tree, unless kinds of equal vigour are used, the tree will lose its balance, though this may in some measure be avoided by working the weakly growers on the highest branches and the vigorous kinds nearer the base. Strong, shy-bearing sorts may be rendered more fertile by double grafting. All grafting tends to weaken the vitality of plants subjected to it; that indeed is its object, and in conjunction with a suitable stock increased fertility is the result. It is owing to this that double grafting becomes valuable where early bearing is sought.

Grafting Compositions.—Various complicated mixtures have been recommended for excluding the air from the wounded surfaces in grafting, but for all ordinary purposes clay or brick earth, with a third of its bulk of manure, a handful or two of chaff from cut hay, all well beaten and mixed with water till they assume a suitable paste-like consistency, will do as well as more elaborately prepared mixtures. As to applying it, first take a small lump of the clay and rub it well into all cracks where any part is exposed, smearing plenty at the same time over the folds of the matting used in tying; then mould a lump into a sort of hollow cake and apply it to the point of junction between graft and stock, so as to envelop the whole of the wounded parts, extending 1 in. or so up the scion and reaching well down the stock to keep out the air there also. The whole must be well fitted, and smoothed, dipping the hands into a vessel of water kept near for the purpose. If dry weather follows immediately after, all cracks, as I have said, must be filled up, but a handful of moss tied over the clay will prevent cracking.

Cuttings.—Some kinds of Apples will strike readily from cuttings. I have often seen this done, and I have thrifty little bearing trees that have been propagated in this way. The most easily rooted are the Codlins, the Burr Knot, Oslin and Kentish Fill-basket. Quite large pieces are sawn off and planted firmly in a cool border. It has often struck me that the Codlins would make excellent stocks for less fertile kinds. In this way anybody might soon establish a miniature fruit-garden of small Apple-trees quite as useful and as interesting as could be had by using the real Paradise stock and with the same surface-rooting proclivities. Pieces about as thick as one's finger could be sawn off and used for this purpose; any one having an old orchard to prune might try other kinds, giving preference to those cuttings that possess at their base a rough warty-looking knob, as they root with greater certainty than others not furnished in that way.

Apple-Trees for Ornament.—Many dislike planting fruit-trees in ornamental grounds, but a group of standard Apple-trees of the bright rosy kinds in the middle distance, a cluster of towering cedars or Scotch pines in the background, but not too near, and a foreground of low shrubs from which spring out here and there isolated groups or single specimens of cypresses, junipers, or other spiral-growing plants of distinct character, would give a pleasant and striking effect to many a meaningless shrubbery. If well cared for the fruit-trees would be objects of ornament at all seasons, even when leafless. Look at a healthy, well-balanced Apple-tree occasionally, from the opening of the new year, and note the gradual swelling of its buds till they burst out in all their matchless beauty of pink and white in May. Then watch the career of the young Apple, its hair-breadth escapes from many insect enemies, until the sun in August has brightened its cheek with a rich glow of colour, and it must, I think, be acknowledged that fruit-culture ought to inspire more interest and enlist more sympathy than it does, and one of the chief ways of effecting this would be to plant in prominent situations, so that all may see how beautiful well-arranged groups of fruit-trees are. A fruit-garden, or pleasaunce, need not be arranged on any formal system, and where the soil was lacking in depth or the subsoil bad, the soil from the spaces between the groups of fruit-trees might be laid over the beds for the latter, so as to form gently swelling mounds. On these raised mounds the trees, from the greater depth of soil and more efficient drainage, would make better and cleaner wood and foliage than they otherwise would do, and would consequently bear more and better fruit. If fruit-trees could be permitted to come within the ornamental precincts, a way of forming tasteful groups, so as to make the most of their ornamental features, and at the same time tone down or relieve anything in their growth that was gaunt or bare, would soon be discovered, and the impetus which this would give to fruit-culture would be appreciably felt.

Gathering and Storing.—When fruit parts readily from its stalk it is generally ripe enough for storing, but all late-keeping kinds should be permitted to hang their full time or they will shrivel. Another indication of ripeness may be found on cutting a fruit through the centre. If the seeds or pips are dark-coloured the fruits are generally ripe enough for gathering. There are also general indications of maturity about the tree itself; its growth and foliage tell the experienced when it has done its work. The Apple chamber must be frost-proof and dry, and as far as possible free from the influence of external change of temperature. Thus a room not exposed to the south is best, and, in fact, there is no better place for late fruits that are to keep past the year than a cool, dry cellar fitted up with shelves round the outside, with a table in the middle for packing, &c., or for laying fruit on required for immediate use. If late Apples are gathered too soon they will shrivel, or if kept in a temperature high enough to cause evaporation from their surfaces, or if the room is a very light one, the same thing will occur. After Apples are gathered and stored the less they are moved about the longer they will keep; the fruits will also be cleaner and brighter if not much handled till required for use; but in gathering, special care should be taken that no bruised, unsound, inferior, or pecked fruits are placed with the best samples. Apples will keep a long time in a fresh sound condition packed in sand in jars or boxes; kinds like Court Pendu Plât, that sometimes shrivel, will always keep well in this way. All fruit should be carefully gathered, placed in shallow baskets and carried to the store. Some lay stress upon the fruit being laid in single layers on the shelves, but I have tried various ways, and, if the fruit has been well sorted, so that no specked or damaged specimens find entrance into the store with the best fruits, it matters little whether placed in single layers, or in heaps 1 ft. thick. All fruits sweat a little soon after gathering—more some seasons than in others—and during the time this exhalation of moisture is going on sufficient ventilation should be given to keep the air sweet and carry off the moisture, and as soon as this evaporation ceases the ventilators may be closed and the room darkened, as the changes that lead to decay go on less rapidly in the dark than in the light. Everything about a fruit-room should be sweet and clean, but it is better to build it frost-proof than to have a fireplace in it, as the cooler—if not absolutely freezing, provided it be dry—the better, and even in the case of a fruit-room that is not frost-proof, a paraffin stove costing about 11s.

or 12*s*. will be better than having a dusty parching fireplace, or to be dependant upon any other means that may at times perhaps be erratic in their action. Of course Apples for keeping should be gathered when dry, and a dry cabbage or rhubarb leaf, or a sheet of paper should be placed in the bottom of the basket to obviate bruising.

Insects and Diseases.—Healthy vigorous trees are not much subject to the attacks of insects, but the moment weakness or debility sets in a host of enemies make their appearance. One of the most troublesome insect pests to which Apple-trees are subject is the American blight, or woolly aphis, and where it once gets a footing it can only be got rid of by the most persistent efforts. If a tree has become badly affected with it the best plan is to grub it up and burn it, or saw it down and graft with scions from a healthy tree. At the same time remove the earth from the surface down to the roots, and substitute fresh material from another part of the garden. The insects will descend the stem and make an attack upon the roots; therefore the latter should be seen too as well as the top. The best and only sure way of dealing with this troublesome pest is to attack it incessantly, so long as one remains, with something disagreeable to it. With paraffin oil in a vessel that can be easily held in one hand, and a small painter's brush in the other, smear the oil over every place where the insect can be seen, rubbing it well in. Gishurst Compound made into a strong lather will also answer the same purpose, and so likewise will soft-soap. But when all the branches of a tree are infested, and have to be anointed constantly, the remedy may prove as bad as the disease, and that is why I think in very bad cases the stamping-out system is best; I have seen trees so bad that I think a law should be made to render their destruction *compulsory*. I was looking over a friend's garden in the suburbs of London some time ago; he had some thriving young Apple-trees planted, but symptoms of this pest were conspicuous. I looked over the garden wall, and there, in a neighbour's garden, only a few yards away, stood an old tree smothered with the pest; in fact the branches looked almost white; of course Apples could never thrive within a stone's throw of that tree.

The Apple or Codlin Moth is another pest that does a vast amount of mischief—not so much to the tree, perhaps, as to the fruit. It lays its eggs in the eye of the latter when quite small, and as the young insect grows it works its way into the centre of the fruit; when it reaches this point the fruit drops, and it leisurely eats its way out, and, secreting itself for a time in the earth, afterwards crawls up the stem and hides in any crack or crevice till it matures itself and comes out a perfect insect in spring. Such being its mode of life it must be obvious that the best time to attack it is when the Apple falls, before it has had time to creep out and hide itself, and I have no doubt in any garden or orchard where the presence of this moth is causing much trouble, if the fallen Apples were gathered up and destroyed daily it would soon disappear. A trap may be laid for it by tying a hay-band or some old canvas round the trunk from July onwards, occasionally examining the bark beneath and killing those that have hid themselves away there; they will be attracted by the shelter provided for them, and many may be thus destroyed. Other moths attack fruit-trees, but their attack is made openly, and in most instances the young caterpillars can be found feeding among the young foliage and easily destroyed. There are also various forms of aphides or flies that in cold ungenial seasons curl up the leaves and otherwise lower the vitality of the tree; but usually, when insects are very troublesome, either the tree has been over-cropped and lacks nutriment, or it is growing in a damp ungenial soil, and though it is necessary to continue the attack upon the insects, yet at the same time the seat of the mischief should be found and the vigour of the trees improved by proper remedies. If the garden engine was more frequently used, the smaller kinds of insects that infest fruit-trees might be dislodged and destroyed, and a high state of health maintained, as there is no better antidote to diseases of all kinds than cleanliness.

Canker has in some situations a ruinous effect upon Apple-trees. It is distressing to see young trees in some gardens with the branches all seared and dead, as if scorched with a fire. Some ascribe the cause to something unsuitable in the soil; others say it is due to frost acting upon badly-ripened wood. I remember the case of an orchard a good many years ago that was healthy and thriving until a sheltering belt of trees was cut down, when the fruit-trees gradually dwindled and died. Trees that are planted in damp ungenial situations are always liable to canker whenever a season more unfavourable than usual occurs. The proper treatment for cankered trees is to cut them well back, so as to remove the cankered parts; cut a deep drain or two through the orchard, lift some of the feeding roots up to near the surface, and top-dress liberally so as to keep them there. With roots thus situated the wood will be better ripened, and frost or cold piercing winds will have a less injurious effect upon them. It generally happens that in soils where canker is prevalent the trees flourish until the roots strike down, and then the canker manifests itself.

VARIETIES.

Culinary Apples, arranged according to their Seasons.—Early kinds: Dutch Codlin, *Keswick *Codlin,* *Manks Codlin, Calville Blanche d'Eté, Emperor Alexander, *New Hawthornden, Cox's Pomona, *Stirling Castle, *Waltham Abbey Seedling, *Lord Suffield. Mid-season kinds: *Alfriston (this will keep till spring if required), Beauty of Hants, *Beauty of Kent, *Cellini, *Cockpit, Kentish Fillbasket, Forge Apple, Golden Noble, *Gooseberry Apple, Gravenstein, Northern Greening, *Yorkshire Greening, *Doctor Harvey, Hoary Morning, Pile's Russet, *Tower of Glamis. Late-keeping kinds: *Norfolk Beefing, *Striped Beefing, Besspool, Winter Colman, Costard, *Duke of Wellington, *Dutch Mignonne, *Warner's King, Ord's Apple, Golden Winter Pearmain, *London Pippin, Stone Pippin, French Crab.

Dessert Apples.—Early kinds: Red Astrachan, *Red Quarrenden, *Irish Peach, Yellow Ingestrie, White Juneating, Red Juneating, *Nonsuch (Langton). Mid-season kinds: Cornish Aromatic, *Court of Wick, Scarlet Crofton, Golden Pippin, Golden Knob, *Ribston Pippin, Scarlet Pearmain, *Downton Pippin, *Fearn's Pippin, *Kerry Pippin, *Orange Pippin, *Reinette du Canada Golden Reinette, Early Nonpareil. Late varieties: Golden Harvey, Scarlet Nonpareil, Baxter's Pearmain, Stamford Pippin, *Sturmer Pippin, *Court Pendu Plât, Boston Russet, Sykehouse Russet, Blenheim Orange, Ashmead's Kernel, *Baddow Pippin, *Cockle Pippin, *Worcester Pearmain, Old Nonpareil.

Apples Suitable for the Paradise Stock.—Lady Apple, Calville Aromatic, Calville Blanche d'Hiver, Keswick Codlin, Winter Colman, Court Pendu Plât, Dutch Mignonne, Early Harvest, Early Julien, Jolly Beggar, Lord Suffield, Braddick's Nonpareil, Early Nonpareil, Northern Spy, Adam's Pearmain, Mannington's Pearmain, Birmingham Pippin, Blenheim Pippin, Cox's Orange Pippin, Stamford Pippin, Boston Russet, Rymer, Margil, Manks Codlin.

The above lists of varieties have been selected with the greatest possible care with a view to their being generally useful; and any kind of Apple that I have found unthrifty under fairly good treatment has been purposely kept out. Of course, among the many hundreds of varieties, or so-called varieties, that are cultivated, many not included here are well worth growing, but my object was not to give a long array of names, even if all were worthy, but to make the list as select and trustworthy as possible. Those marked with an asterisk are highly recommended. Whoever plants fruit extensively should, previously to doing so, spend a week or two in looking round the neighbourhood to ascertain what kinds are thriving there, and give a preference to those kinds. The lists I give have been selected for their good general qualities under all circumstances, and may be safely relied on; but I have occasionally met with local varieties peculiar to a particular district well worth attention and extensive cultivation in that district.

THE PEAR.

The natural habit of the Pear is free and vigorous, and when left to itself the tree usually assumes a conical outline. As a rule, a tree that sends its main branches up almost vertically pushes its roots deeply into the earth in order to obtain the necessary stay or anchorage. Thus, in the case of standard trees, where considerable freedom of growth is permitted, depth of soil with a well-drained bottom becomes a necessity. It is a matter of less importance what the subsoil is composed of, if it be but dry and has a good depth of fairly good soil above it. Doubtless there are soils, such as stubborn retentive clays, impregnated with iron or some other deleterious substance, where the Pear will not long thrive, but no one would think of planting a Pear orchard *in such* situations; and as regards the few trees required in garden culture, there are ways and means, which will in due time be noticed, of keeping the roots from penetrating an unsuitable subsoil. Good Pears, both in size and quality, have been produced over a subsoil of sheer red sand many feet in thickness, and I have gathered fruit, excellent in every respect, where the bottom was a deep bed of blue gault. It is also true of every conceivable variation between the two, but the site must be well drained, and there must be 2 ft. of good soil for the trees to grow in. In Pear-culture, more so, perhaps, than with any other kind of fruit, the thing that really annoys one most is the way in which the quality varies in different soils and aspects, and in garden culture the latter circumstance very much influences quality; so much so, indeed, that it is most important the peculiarities of each kind in this respect should be known, so that their wants, so far as is possible, can be provided for, as a variety of Pear that is hard and gritty in one aspect may be melting and juicy in another, and *vice versâ*. Though the array of names in the catalogues is of formidable length, the varieties that can be recommended for general planting are not so numerous as might be supposed. Some of the comparatively new kinds that are at present but little known to the general cultivator will probably come out well on a closer acquaintance, but time is required for testing them thoroughly under varying conditions. The Pear is one of the most useful and profitable of hardy fruits, and its culture, undertaken in a liberal and thorough spirit, is sure to be very interesting. There is no open-air fruit that is capable of doing so much for a first-class dessert for so many months in the year; as a rule, Apples are not much cared for at dessert, but good Pears are always eagerly sought after. There are many modes of

Training, all of which are more or less useful under the varying conditions of cultivation. Whatever may be said to the contrary, the mere contemplation of a well-trained tree gives pleasure to a well-ordered mind. Exactitude of training, if it be necessary to train at all, should be insisted on; as a careless, slovenly system, very often leads to the tree losing its balance and becoming disorganized. Those people who complain about training as being useless have probably some such specimen in their mind's eye at the time, and are measuring all by the same standard. It was the exigencies of the cultivator's circumstances, the uncertainty of the climate, the ever-varying conditions he had to contend with that first suggested the restriction of the branches and training them in various forms in order to obtain earlier, better, and more certain results, and a reasonable amount of success has everywhere been obtained; and, as a rule, the more thoroughly the work has been done, the better the result. It is well to have large-headed standard trees, each producing bushels of fruit. It is well also to have walls furnished with wide-spreading trees where such a system succeeds and gives satisfaction. But room should be found for the fertile espalier and the handsome pyramid, not forgetting either, if occasion offers, the palmette or the cordon. I do not claim to have the gift of prophecy, but in looking into the future I fancy I can see the walls covered with a much larger number of trees of less spreading proportions, but which are more easily kept under control. I should like to see every bit of wall-space covered everywhere with fruit-trees, where there was the least chance of their thriving. The coming generation will not wait years for a tree to make a large breadth of wood before it begins to bear. It is not often that a large old tree pays the rent for the wall-space it occupies; usually roots have got beyond the control of the cultivator, and the thing is submitted to because to re-graft or cut down and cart away would leave a blank on the wall for a time. In the future speedier results will be required, and no doubt will be obtained. For open-orchard planting, standards on 6-ft. stems are doubtless the most suitable, and in favourable situations many of our best old-established varieties will succeed fairly well. Many years ago I remember in Worcester an old standard tree of Marie Louise that bore immense crops. Knight's Monarch, again, does well as a standard, as does also Williams' Bon Chrétien. In the preparation of the site before planting, the directions given in the case of the Apple will apply with equal force for Pears. Except the roots are well cared for the trees cannot long continue in a flourishing condition, and no skill in top management can compensate for lack of preparation of the ground before planting. A young tree should never be planted where an old one has previously stood. Always select a new site for an orchard of young trees. In the case of wall trees or trees in walled-in gardens generally, this cannot always be done, but the soil can be wheeled out to another part of the garden and fresh brought back in its place, and although the labour will be considerable, yet all who aim at obtaining the best possible results will not grudge it. In fruit-culture, if things are done grudgingly, especially in the matter of placing fresh soil round the roots, the result is too often far from satisfactory.

The Espalier.—There is no fruit-tree that submits so readily to training, and that seems to flourish so well under restriction as the Pear. When the branches are young, they possess great flexibility, and will readily assume any possible form. That Pear-trees with growth curbed and checked are fertile and profitable is well known, for such trees are common everywhere; they are, in fact, a necessity in shallow soils and must be accepted as such, as although Pears like a deep soil, and must have it if a large top development is sought, yet shallow soils can be turned to good account by using the Quince as a stock, and by the adoption of a system of training that will equalize or distribute the growing force of the tree in a proper ratio over its whole surface. This, in fact, should be the aim of all training, and any method that does not accomplish this falls short of what is required. The horizontal form of training is a very suitable form for Pears, if the lower branches of the tree get a good start of those higher up, as without this is done the bottom branches generally remain weakly, and are, in short, robbed of their proper share of nourishment. The sap meets with less friction in its upward course towards the top branches, and they consequently get the major part of the supply, unless the lower branches are first given such a start as enables them to maintain a lead. This is generally accomplished by heading back the trees the first year, if maidens, to the bottom wire, and taking a young shoot right and left of the stem to fill it. At the second winter's pruning cut to the second wire, and the following spring take out two shoots to clothe that also. Maidens are not always the most suitable trees to plant, two-year-old trees for various reasons often doing better; and, besides, when espaliers are well constructed no time should be lost in furnishing them, and so enable a return to be made. It often happens when a tree only one year worked is lifted its growing force seems too much checked. All maidens are not alike, but in some cases another year without lifting would make into good trees what turns out stunted failures. This proves what I suppose no one will deny, that much discrimination is necessary. In some cases maidens answer well; in others it is better to plant older trees. In the construction of espaliers no one now-a-days should use stakes or wooden fencing of any kind; they are constantly giving trouble; better by far to have the work substantially done; and if the expense cannot be afforded, train the trees in some form for which no trellis is required. But I will assume that

Iron Espaliers are used, and they should not be too low; in small gardens they should be 5 ft. high, and in large ones they might be 7 ft. or 8 ft. high. The bottom wire should be 1 ft. from the ground, as any fruit that touches the earth will be deficient in flavour and appearance. For tall espaliers on good ground the trees should be worked on the Pear stock, and the free-growing kinds should be from 18 ft. to 20 ft. apart. Many trees, no doubt, will cover more space, but large old trees after the lapse of years only produce fruit at the extremities of the branches, and smaller trees, with the roots kept near the surface and the branches in a regular state of fertility, are generally more profitable. If we give a tree a large space to cover, we must give it a correspondingly wide and deep-root run, and in so doing we lose touch of it, so to speak, and too often it runs riot, gets beyond control, and suffers accordingly. After the three first years, when the trees have become strong and the bottom branches have obtained a good lead, the main central stem may be encouraged to produce two pairs of side branches annually until the trellis is furnished. The best way of doing this is to head down the main central stem to the required point about midsummer, and select the best-placed shoots for the second pair from those that break. Except the main central stem, no other leading shoot should be headed back till the trellis is covered. The espalier wires should be about 10 in. apart; less does not give room enough for the production of good foliage, and more is unnecessary. The best material for tying in the young shoots is matting or raffia. The oldest branches may be supported with small twigs of the golden willow, which are very strong and cost nothing, as they will grow anywhere. Always in tying branches of fruit-trees leave space enough inside the ligature for the branch to swell. Young hands are somewhat careless about this. Whenever a doubt exists about the suitability of the subsoil the bottom of the hole should be made impervious to the roots. Open the holes about 3 ft. square and 3 ft. deep, if the soil will admit of it, but it will be better to have a shallower hole and feed the roots near the surface with rich mulchings than permit the roots to descend to a stratum that will throw them and the tree they support out of gear. The bottom of the hole should be made level, and either be paved with tiles, bricks, or stones laid in good mortar, or about 4 in. in thickness of concrete should be placed in the bottom. In either case the foundation must have a few hours to dry and set before anything is placed on it. The trees should be carefully selected with clean healthy stems, and if on the Quince stock should be planted deep enough to cover the junction, as sometimes the stock and scion swell unequally, but when the former is wholly buried roots will generally be emitted all up the stock in course of time, and the trees on them are consequently longer lived, and in some soils this is an important consideration. There should not be even a moment's unnecessary exposure of the roots when planting, and every wounded or lacerated root should be carefully trimmed with a sharp knife. All trees for the whole season's planting should be purchased and brought home in November, have their roots carefully trimmed, and be laid in carefully by the heels in some dry piece of land. This course gives the purchaser the pick of the trees at the nursery. And even if the trees are not finally planted for a month or six weeks after, the work of healing and callusing is going on, and they will start all the better for the early lifting. If planting must needs be deferred till after Christmas, the trees might be obtained and prepared in the autumn all the same, and I should expect such trees to do nearly as well as if planted in autumn. I have proved this, and I think it is worth bearing in mind, as sometimes the planting cannot be done as soon as wished.

The Pyramid.—This form seems natural to the Pear, and where the soil is deep and suitable, and the trees are worked on the Pear stock, and are not too closely pruned, large trees that will bear immense crops of fruit will in a few years be formed. But where the subsoil is not so well adapted for fruit culture the trees should be grafted on the Quince, and some means employed, as recommended in the case of espaliers, for keeping the roots out of the unfavourable subsoil. In the selection of the trees those only with a straight central leader should be chosen, and this central leader should be shortened more or less every year to induce it to throw out a sufficient number of side shoots to form the framework of the tree as it proceeds upwards. When the trees bear freely the load of fruit will keep the branches down, and prevent too rapid growth; and to induce an early fruitful habit and check redundancy of growth, after the trees have been planted five or six years they should be dug up carefully, without injuring the roots, and be immediately planted again in the same position, spreading out the roots near the surface and shortening those just a little that are showing a tendency to descend. However, in most cases simply lifting the trees and replanting will be sufficient check to throw them into bearing. Where the soil is of a light, loamy character, it can scarcely be made too firm when the trees are planted, if it is dry. The soil under the tree should be trodden firmly, the roots spread carefully out, and some good mellow soil spread over and amongst them. Trees in loose, light soil make long naked roots, instead of those possessing plenty of fibres or feeding points, and if not lifted or root-pruned, they soon become disorganized. The pyramidal is the cheapest kind of tree to plant, and is a form well adapted to those who intend planting a considerable number of trees with a view to profit. The distance to plant them from each other must depend entirely upon the nature of the soil. My ideal of a pyramidal Pear would be 12 ft. high and about 10 ft. in diameter at its base; and every one that begins any system of culture should form in their minds an imaginary specimen tree, and work in the direction indicated. Trees 12 ft. high should not be less than 12 ft. apart each way, and this would give about 300 trees to the acre, and, if the right kinds were planted, I am convinced the plantation would be a success. If any undergrowth was permitted at all, it must be something that required only surface culture after the Pear trees came into a bearing condition. It is a mistake to plant fruit-trees, expecting them to be fruitful, and then destroy their chance of producing fertile blossoms by reason of their roots being driven down into the earth by too much spade work. Rather, when the days are long and the sun powerful, scatter a few inches of half-decayed manure over the surface round the trunk of the trees, to encourage the roots to come upwards for food, and so be brought within solar and atmospheric influence, without which no trees can long continue in a healthy, fertile condition. If there is one thing in tree life more wonderful than another, it is the way *in which* the roots discover and follow up their food.

The trees need not be planted more than 6 ft. apart at first, and then, when more space was required, some of them might be lifted and planted elsewhere, leaving them finally 12 ft. apart; or, if they are planted their full distance at starting, other crops may occupy the intermediate spaces, still leaving the soil near the trunks untouched by the spade.

The Palmette Verrier.—To my mind a wall covered with Pear trees, in a healthy, fertile condition, is one of the most interesting sights in fruit culture, and the intrinsic value of the crop would be considerable. For small or moderate-sized gardens, large spreading trees are not the best or most profitable to plant. If I had a new wall or an unfurnished wall to cover with Pear trees, I should plant the Palmette Verrier. If the wall was less than 10 ft. high, I should purchase them on the Quince, plant 7 ft. apart, and train seven branches from each tree 1 ft. apart. The Palmette Verrier is a combination of the horizontal and the vertical. There is a main central stem, which is led up straight and perpendicular, throwing out a pair of side shoots at the bottom, which are trained horizontally till the outside limit of the tree it is intended to cover is reached, when they are trained up vertically to the top of the wall. The second pair of branches is originated 1 ft. higher, and is trained horizontally 1 ft. less, when they also are led up vertically to the top. The third pair of shoots will originate 1 ft. higher still, and will have still less horizontal training. The form of the tree is simple when once understood. The horizontal projection of the branches before they assume the vertical tends to equalize the sap, and there is no form of training that secures better balanced trees, or that fills a wall quicker or better, as there are no blank spaces. If the wall is more than 10 ft. high the trees should be worked on the Pear stock, and be planted 9 ft. apart, and be trained with nine branches; but of course those who like may train with a less or a larger number of branches; I am only giving my own ideas upon this, but there is no recognized rule. The branches should not be trained nearer than 1 ft., for one of the greatest mistakes in fruit culture on walls is covetousness, covering the wall too densely with branches, and deceiving ourselves that by so doing we obtain more fruit. When the branches of Pears are trained nearer than 1 ft. they steal each other's light and air, and, in the struggle, long ugly spurs are made that not only have an unsightly appearance, but carry the blossoms away from the shelter of the wall. In a great measure the barrenness of the centre of large old Pear trees is due to overcrowding of the branches; the leaves being small and puny, the buds they support at their base must be weak, and the young wood forming the spurs partakes of the same stunted character, and fruit-bearing ceases, except at the extremities, where less breastwood is made, and where more light can reach the main leaves. When one of those large old spreading Pear trees—grand old trees to look at when the leaves are down, and the branches are laid in with mathematical precision on the face of the wall—attains the age of thirty or forty years, or in some cases less, unless the branches have had space enough, the leaves and buds in the centre of the tree never seem to have force enough in them to produce fertile blossoms; everything, in fact, depends upon the character of the foliage. It would be possible, by an examination of the leaves of a tree, to tell its condition without seeing the tree at all, because none but a healthy tree ever yet produced sound, healthy, properly-developed foliage. The Palmette is also suitable for espalier training, and is adapted for nearly all kinds of fruits. But perhaps one of the most profitable and interesting purposes for which the Palmettes could be employed would be to plant them on each side of a long, broad path, and train them over to form a Pear-covered walk. I have seen such Pear-covered arches, and most interesting they are, and the first cost of the trellis would not be more than the same number of square feet of espalier; and this way of growing Pears, or other fruits, seems to me to be making the most of things, for the shade in summer does no injury to other crops.

The Cordon.—Like the Palmette Verrier, this kind of tree does not find much favour with gardeners, who like to see a good wide-spreading tree with branches reaching 20 ft. or more along the wall. Though I should not recommend a whole wall to be planted with cordon Pears, as I prefer the Palmette, yet for covering blank spaces anywhere they are very suitable, filling up quickly and coming into bearing immediately. This is a great advantage; if we plant our trees at wide intervals we must wait wearily for fruit, and perhaps death may call upon us first. No, except in great gardens, where all things may be on a great scale, the days of large trees are over; speedy results are required, and there is no reason why they should not be obtained. Besides, with smaller trees on the Quince, we may have more variety in our fruits, and a greater prospect of always having a crop on some of our trees. When one of the monster trees fails to produce blossoms, or if they refuse to set, it is like losing the produce of a good sized garden. But by planting a greater number of trees to occupy the same space we shall certainly have a better prospect of having a crop. And I have noticed when a bad ungenial season comes, the comparatively young medium sized trees always beat the old ones. This, indeed, is only reasonable, for the smaller, younger tree has its roots near the surface, and gets the benefit of the solar warmth where there is any; and in bright sunny summers the roots can be fed near the surface and made comfortable, but the roots of the big tree have to cater for themselves, and are away among the crude unwholesome clay or gravel subsoil. Cordon training need not be confined to walls, or even espaliers. They may either be trained along a single wire by the side of the paths as an edging, or a series of wires may be run in parallel lines about 18 in. from the ground and double cordons trained over them; and there are other modifications of the system that will suggest themselves to any one that gives much thought to the matter. A plot of land of any given size may have wires strained over it at suitable distances; beneath those wires Pears on the Quince can be planted, having previously well prepared the site, and in two or three years a most interesting collection of Pears in full bearing may be had. I have seen this system adopted very successfully in large gardens, but it is to the amateur without a walled-in garden that it will prove the greatest boon, both in providing him with a never-failing source of interest, and a very choice addition to his dessert.

Best Aspects for Pears.—All aspects are suitable for some kind of Pear; good Jargonelles and other early kinds have been grown in a north aspect, but the late kinds require a better climate, and a longer season, and a freer circulation of air than can be had from the north side of a wall. There is no doubt the shelter of a wall does give increased size to the fruit, but I have met with many instances where the large, handsome fruit from an east or west wall has been inferior in flavour and melting condition to the smaller specimens from pyramids or espaliers that are growing fully exposed. In our changeable climate there are seasons when a thick, heavy atmosphere prevails for many days together, and the sun is scarcely able to struggle through. It is in view of, and to meet, such times that I say plant Pears on walls; in short, plant them anywhere and everywhere. If there is not space for a full-sized tree, plant a five-branched Palmette, and if there is only a foot or two vacant plant a cordon. Let the early kinds occupy the worst aspects, and reserve the best places for the choice winter fruit. The same rule holds good with regard to espaliers. Let all be filled up, and plant cordons, and pyramids too, wherever there are suitable positions. Certain I am no one having space for fruit trees will regret planting good kinds of Pears, as their value in a commercial sense is greater than most other kinds of fruits. In planting trees against a wall leave 3 in. or 4 in. of space between the lower part of the stem of the tree and the wall. When planted close to the wall the stem has not sufficient room to swell, and it is no uncommon occurrence to see the tops of old Pear trees forced from the wall by the pressure of the swelling bole at the base. It is well to have Pears on walls in every conceivable aspect. It is well also to have Pears in the open border under all the conditions, as regards training, aspect, &c., that I have noticed, in order that good fruit may always be obtainable in bad seasons. Many instances could be given where the same kind of Pear varies so much in the same garden as to appear a totally different kind, owing to the influence produced by aspect and training. In planting a wall of Pears, unless the subsoil is dry and warm, the bottom of the border should be paved or concreted 6 ft. wide from the wall, and the concrete, if concrete is used, should be of sufficient thickness to be impervious to the roots—from 4 in. to 6 in. will suffice in most cases. The depth of soil should not be less than 2 ft. for the palmette and cordon, or other small or moderate-sized trees, and 3 ft. will not be too much for large growing trees on the Pear stock. The distances the trees should be planted from each other should vary according to the stock used, kind of training, &c. Pears on Pear stocks trained horizontally will cover a large space. I have seen such trees covering 40 ft. in length of a 12-ft. wall; but I don't believe in such trees; I would rather have two or three trees occupying the same space. The same remark holds good with trees of all forms of training. Full-sized standards in the orchard may stand 20 ft. or more apart if left to grow unchecked, but if root-pruned then less will suffice, as after they are brought into bearing they make less wood. So it is with the pyramids. It is a cultivator's question; if he likes to lift or root-prune, the distance may be reduced; but if on the Pear and full growth permitted, 20 ft. will not be too much; if moderately pruned, 12 ft. will be enough. When grafted on the Quince the trees may be planted nearer to each other, though of course the treatment it is intended to give the trees must be taken into consideration. If lifted or root-pruned, from 4 ft. to 6 ft. will give space enough for years; but if an opposite course is followed, 8 ft. or 10 ft. will be better. Some allowance, too, must be made for the character of the soil and climate of the place, as these have an important bearing upon the tree's development. No practical man will lay down any hard or fast line either for depth of border or the space a particular form of tree is to occupy, as such a course prevents a cultivator taking advantage of his situation and making the most of his circumstances.

Summer Management.—Fruit trees in training may be compared in many respects to boys at school. A strong firm, yet withal gentle hand, must be laid on some to repress and check evil habits, to control that tendency to get out of order that seems so irrepressible in vigorous youth. There is much, too, in common in their necessities as regards summer management of all kinds of fruit trees; therefore much that has been written about the Apple will apply to Pears and other fruits that will be treated of subsequently. There is the same need for keeping the growth thin. There is the same need for the exercise of discrimination between the different subjects and their varying constitutions. We have not only to guard against faults of omission but also those of commission, which are often the most dangerous. The cultivator that in summer pruning applies the same rule to all alike unthinkingly will be led into error. There are Pears that make a good deal of wood, and the growth of these must be thinned and regulated in summer; but there are others which, when fairly brought into bearing condition, make so little wood, it may be left on till August to give activity to the circulation. Winter Nelis and Easter Beurré, two excellent late Pears, belong to the latter class, whilst Duchesse d'Angoulême belong to the former. Again, there are seasons when the summer pruning may be delayed till July, or in some cases later; but when the crop of fruit is thin and the growth more exuberant it will be better to begin pruning early, or, say, about the end of June. A tree that is well laden with fruit is not likely to become over luxuriant, and it is never wise to trim every green twig off such a tree. It will be gathered from what I have written that I look upon a crop of fruit as the best and most natural regulator and steadier of a tree's system, and that the summer pruner's skill should be mainly directed to those trees that do not bear good crops, in order to induce them to do so. To this end, a watchful eye should always be given, but especially in August. It is then that the fruit-buds are in course of formation, and a little extra growth or a little less sunlight may convert what might have been fertile buds into leaf growth. In their early stages the difference between the buds that produce blossom and those which produce leaves is but slight, if indeed there be any difference, and the production or the conversion of one to the other often depends upon a slight check given to growth, or a larger influx of light at a particular season. If we examine any Pear tree in August, we shall see, if the tree is in good condition, numerous short spurs scattered all over the tree from 1 in. to 2 in. long. Marie Louise and one or two others bear fruit on longer spurs, but, speaking generally, the fruit spurs do not exceed the size I have mentioned, and they are often less. At the end of the spur is a stout little bud, which at the season I have named is already showing signs of plumpness and fertility, and it is about this period that all surplus wood should be removed, to let in the sun and air to ripen these partly developed fruit buds. Though the work of filling up and elaborating the buds is doubtless going on always, yet there is a time when the final impulse to fertility or the reverse is given which no after treatment can alter, and that time I think is in August. Thinning of the fruit should be commenced as soon as all danger of frost is passed—removing the weakly and deformed fruits that can never make perfect specimens, first; later in the season, or in July, the final thinning should be given, and in the majority of seasons the young fruits from this last thinning will do for stewing or cooking. The best kinds of dessert Pears are excellent for stewing when in a green state all through the summer. Except by the best cultivators, thinning of the fruit is far too much neglected. "Hanging like ropes of onions" is a very common boast, but I never hear it without a feeling of pity for the person making it and those he caters for. We cannot eat our cake and have it too; and overwork in the case of man, beast, or tree will tell its own tale; besides, overwork in nine cases out of ten means work badly done. The fruit from an overloaded tree is always imperfectly finished; but no one can say with certainty how much weight a tree should carry without seeing it, as what would be a heavy load for one would only be a light one for another; and it will be obvious, too, that when extra help is given in summer, at the time when the load hangs heaviest, the exhaustion following a severe effort may be mitigated or removed. There are two principal ways in which help can at critical moments be given to trees bearing heavy crops. The first is by mulching with good manure over the roots, and, if possible, as far as they extend, and the second is by watering with sewerage or liquid manure; even plain pond-water will be useful if the stronger liquid cannot be had. Mulching and watering in the case of Pears on the Quince grown in shallow borders is well-nigh indispensable.

Winter Management.—This consists in pruning, training, and in dressing the trees for the destruction of scale or other insects, when such are present. As regards pruning, where the directions for summer management have been properly carried out the pruning in winter will consist mainly of cutting out old or dead spurs, where such are to be found, and in shortening and smoothing the snags left from the summer pruning. In training trees on wall or trellis, all ties that are likely to become tight during the next summer, even if they are still strong, should be removed, and new ones, loosely placed, substituted. Where nails and shreds are employed every branch should be gone over systematically, and all unsound or tight shreds removed, to be replaced with new.

Young hands are very apt to use more of both than is really necessary, and much time and material is wasted in consequence. The tree should be securely fixed to its support, but all labour beyond that is worse than wasted. It would be an advantage if all walls were either wired or studded, and the trees tied to the wires or studs, as the case may be. Whatever is used for training, other than nails and shreds, should be driven in almost close to the wall, to bring the trees as much under its shelter as possible. Training with nails and shreds not only takes up more time, but the materials cost more, and, worst of all, the holes made in the wall are so unsightly, and are such a harbour for insects. I have already said something of the advantages of exactitude in training. Negligence or slovenliness in the work is often the prelude to a laxity in other matters. Every man or boy who aspires to be a good fruit grower should either possess a true eye, or should assiduously endeavour to cultivate the faculty of detecting when a tree is truly balanced and the branches laid in rightly, as anything that deviates from the truth is displeasing to the trained eye and mind; and not only is this so, but a well-trained equally balanced tree, if not too tightly braced up, is likely to be more fruitful and to have a longer existence than if neglected and the work imperfectly done. In the thinning and pruning of orchard trees all that has been written about the Apple is applicable to Pears.

Insects, Diseases, &c.—On suitable soils the Pear lives to a good old age without being much subject to disease or insect attacks, but in some seasons on light soils the Pear slug—the slimy larvæ of a species of sawfly—is very destructive. The perfect insects are generally flying about in May, or early in June, and the eggs are deposited mostly on the upper side of the leaves, where they feed on the green matter of which the leaves are chiefly composed. The slug-like larvæ are generally most destructive in July or August, and if some means are not immediately taken to destroy them, they will rapidly strip the trees of their leaves, to the ruin of the crop of fruit and the general weakening and disorganising of the tree's health for the future. In my experience in dealing with this insect, I have always found quick-lime dusted on through a dredger quite efficient in destroying them; clear lime-water, too, is nearly equally effective, and leaves less deposit on the foliage. Other remedies have been recommended, such as Hellebore powder, and whatever is used should be used promptly. There is a species of brown scale that is sometimes found on the branches of Pear trees, drawing its food through the bark, and though its action may not produce any immediate effect, yet it surely, though slowly, weakens the trees, and measures of attack should be taken before it becomes numerous. Painting or washing the branches with Gishurst Compound in winter, 8 oz. to the gallon of water, will destroy it, and cleanse the bark from Moss and other parasites at the same time. The compound may be thickened into a paint with clay, lime, and soot in equal portions, with a handful or two of sulphur added, and applied with a painter's brush, rubbing it well into the crevices and cracks of the bark. Caterpillars sometimes coil themselves up in the young leaves in early summer, and must be sedulously sought for and destroyed by hand-picking. In ungenial seasons and on cold soils and aspects some delicate kinds of Pears crack, and are further injured and disfigured by mildew. Glou Morceau, an excellent winter Pear, is sometimes injured from this cause. Where it can be done, the best remedy is to move such trees to a better aspect, or at least lift the roots nearer the surface, adding fresh loam, and mulching the surface with manure to encourage the roots to continue there. Canker sometimes attacks Pears in the same way as Apples are affected, and it generally arises from the same cause—viz., deep rooting in bad soil causing watery, unhealthy, badly-ripened growth.

Renovating Old Trees on Walls.—Walls are too expensive in construction to be indifferently covered, and I think it is perfectly certain that in the long run there is no fruit that will pay better for wall space than Pears. But then the whole face of the wall must be covered with fertile wood, not wide-spreading trees with the middle unfruitful. The best way to deal with trees in this condition is, if they are trained horizontally, to cut the branches back to the trunk and start afresh with new wood. This should be done tentatively, not all in one year, commencing with thé bottom, to give the branches there a start, and then work upwards. Cut about a third the first year, and so on, completing the renewal in three years, and this may, in most cases, be done without a total loss of crop. Another way of performing the same operation of renewal in less time is to leave on the bottom pair of branches and cut off all the others close to the trunk, trimming off all spurs from the pair of branches left. When the spring comes round and the pent-up force of the tree rushes out, which, having fewer outlets, it will do with amazing strength, the necessary number of shoots can be selected and trained up vertically 1 ft. apart. If another pair of branches are left about half-way up the tree, some time may be gained, as vertical shoots can be taken from them also, and the wall may be clothed, or nearly so, in one year. At the end of the summer it will be a good plan to open a trench 6 ft. or so from the trunk of the tree, and try to find some of the roots, bringing them nearer the surface, adding at the same time some fresh soil or manure to encourage them to make new fibrous roots and get the tree quickly into a free bearing condition. Pears on espaliers may be served in the same way if unfruitful from the same cause. Any variety that has proved unsuitable to the district should be regrafted with a variety that has proved reliable.

Gathering, Storing, and Maturing the Fruit. —Some of the early Pears may be left on the tree to ripen, but others, like Williams' Bon Chrétien, should be gathered a few days before they are ripe; indeed, I generally like to gather all, except the commoner kinds, a little time before ripe, as, if left too long, and they fall from the tree, they are bruised and sometimes unusable. The general custom is to gather the Pears on any given tree all at once, but there is a period when the work of the tree in regard to each fruit is completed, and it is at such time that the fruit should be gathered, just before its fall to the earth by the force of its own gravity. But that period does not arrive to all the fruits at the same time, therefore it cannot be right to gather all at one time. To have Pears in perfect condition, and to make the most of the crop, the trees should be gone over two or three times, taking the ripe ones only each time. To ascertain when a Pear is fit to gather, grasp the fruit with the fingers and thumb and raise it upwards, and if the leverage thus brought to bear does not cause the fruit to part from the stalk readily, the fruit is not ripe. I hope I have made it plain that when all the Pears are gathered from any given tree at the same time some must be unripe, and this, especially in the case of late kinds, is one of the chief causes of their shrivelling. The fruits must, of course, be gathered carefully, and all blemished and inferior specimens be placed by themselves for cooking and stewing, or for present use, the best only, except in a time of scarcity, to be stored away with great care in a well-arranged fruit room. Many of the fruit rooms, even in good gardens, are not well adapted for keeping fruit. A fruit room should be dry, and possess a steady, regular temperature, and should be frost-proof. To secure this more pains must be taken in their construction than is customary. The fittings are of far less importance than that a steady, regular temperature, free from frost and damp, be secured. Of course any builder can construct a frost-proof building if he is instructed to do so, and it is better to incur a little extra expense, and it need be but little in doing so, than to build a mere shell of a place and put a fire-place or hot-water pipes in to dry up and shrivel the fruit. But there are in most country houses dry, frost-proof cellars, often unoccupied, that might, at a trifling expense, be fitted up for the choicer kinds of late Pears, where they would keep in prime condition till their proper season arrived. And a place of cool even temperature would be exceedingly useful in summer, when Peaches and other soft fruits came on faster than they could be consumed. In bringing Pears to the best possible point of maturity some help is sometimes required. I have known Pears, especially late kinds, which, if left in the fruit room, never would become melting and good flavoured, but move them to a forcing house, or place them in a warm cupboard for a week or ten days, and the effect is magical; what was before hard lumps of crude, turnip-like matter become delicious and melting under the influence of the extra warmth. Late Pears keep very well wrapped in paper and packed away in boxes, barrels, or in earthenware jars; this economizes space, and the fruit keeps well, only of course none but sound, good specimens *should be treated* in this way.

Protecting the Blossom.—Pears generally open their blossoms before the Apple, and are consequently, to some extent, more liable to injury from spring frosts; but it is the cold piercing wind that does so much injury to fruit-tree blossoms during a cold spring, especially when the flowers are damp, and it is to shelter from the biting winds and damaging effects of snow, sleet, and cold rains that most of our efforts should be directed. I have often noticed in old-fashioned gardens, where old buildings with projecting overhanging eaves abound, that the fruit trees against such buildings are seldom without a crop, and no doubt a building of any kind is warmer than a mere wall. I was walking over a garden last summer and noticed a singular instance of the effect of the shelter afforded by a slight recess in the wall. A Pear tree was trained on the gable end of the stable; there had formerly been a window near the centre towards the top to give light to a loft. And in bricking it up only 4½-in. work was employed, and as it was built flush inside, a recess some 5 in. deep, the size of the window, existed outside. The Pear tree covered the whole gable end, and in this recess the fruit hung thickly, whilst on the other part of the tree the fruits were very thin. The difference was remarkable. I examined it closely to see if it could be accounted for in any other way, but I was obliged to come to the conclusion that the shelter afforded by the recess was the cause of the difference in crop. If we could keep off cold storms of snow, sleet, and rain, and break the force of the cutting wind, we might at least count upon having a moderate crop of fruit in even difficult seasons. In walking across a bleak open heath or common the moment we leave the open country and enter amid the lanes and hedges of the cultivated districts we feel the effect of the hedges in toning down and softening the wind, although the hedges may be bare and leafless. A patch of Furze or a Thorn hedge holds the wind in its tight embrace and seems to rob it of its icy coldness; and the knowledge of this fact has led many to make a free use of branches to protect fruit-tree blossoms. Up to the present time this has been mainly confined to evergreen branches such as Yew and Spruce Fir, but I think so far as Pears are concerned small branches densely loaded with small twiggy growths even without foliage would be found very useful in preserving and sheltering the blossoms; small pieces of Birch, Elm, Lime, and Hazel, or any other tree that produced a goodly number of small twigs, the thick end tucked under the Pear branches, leaving the twiggy points drooping downwards, would often arrest the cold particles of snow or sleet and convey it to the earth. They would also help to break up and distribute the force of the wind; they would cost next to nothing, and we may rest satisfied that if they did no good they will do no harm. We all know the value of even a single thickness of old fishing net as a protection to fruit trees or any other plant in spring, and branches rightly distributed are as valuable as nets. Looking back and taking note of the many instances where a crop of fruit has been saved by a good coping, I can have no hesitation in recommending temporary copings to be used in spring, either made of glass, wood, canvas, or reeds. My idea of a good coping would be something that could be worked on hinges, and folded back on the wall in fine weather to give air to the tops of the trees. The objection to all wide copings is they give shelter when the trees would be better exposed. I have never seen any arrangement of this kind at work, but I don't see any difficulty about it; it should be made as light as is compatible with strength.

***Best Pears* to Plant.**—EARLY PEARS.—Doyenné d'Eté; * Jargonelle, does well on Quince; * Fondante de Charneu; * Bon Chrétien (Williams'), does well in all situations; * Beurré d'Amanlis, does well on Quince; Beurré Giffard; * Fondante d'Automne; * Flemish Beauty, does well on Quince; Hazel or Hessel, standard for orchard; Autumn Bergamot, Quince; * Beurré Goubault.

AUTUMN PEARS.—Gansel's Bergamot, for wall; * Beurré Brown, wall; Beurré de Capiaumont, Quince; * Beurré Hardy, Quince; Beurré Clairgeau, Quince; * Beurré Diel, Quince; Napoleon, wall; Passe Colmar, wall; Prince Consort, wall; Seckle; Suffolk Thorn, orchard standard; Swan's Egg, orchard standard; Thompson's, orchard; * Van Mons Leon le Clerc, wall; * Beurré Bosc; * Beurré Superfin, Quince; * White Doyenné, Quince; * Louise Bonne of Jersey, Quince; * Knight's Monarch, standard orchard or pyramid; Comte de Lamy; * Gratioli of Jersey; * Marie Louise d'Uccle, Quince; * Marie Louise, good in all positions; * Doyenné du Comice, Quince; * British Queen, Quince; Conseilleur de la Cour; Baronne de Mello, Quince; * Urbaniste, wall; Durandeau, Quince; Aston Town, standard; * Pitmaston Duchesse d'Angoulême, Quince; Fertility, Quince.

LATE PEARS.—* Bergamot d'Esperen, Quince, wall; * Beurré Rance, wall and espalier; * Beurré Easter, wall and espalier; * Winter Nelis, Quince, wall; * Ne Plus Meuris, Quince; Van de Weyer Bates, wall; * Beurré d'Anjou, Quince; * Beurré d'Aremberg; Beurré Sterckmans; * General Todtleben, Quince; * Glou Morceau, wall; Beurré Bachelier, Quince; Zephirin Grégoire; * Josephine de Malins, Quince; * Victoria, Huyshe's, wall; Jean de Witte, Quince; Crassane, Catillac, stewing; * Uvedale's St. Germain, stewing.

When convenient, a few of the best kinds, indicated by the asterisks, should be grown in duplicate, and planted in various aspects. I have had Beurré Rance excellent from an east wall, and I have had it the following season almost flavourless from the same tree, whilst the fruits from an espalier, although rough and small, were delicious, and I could relate a similar experience with many of the mid-season and late kinds; therefore, any variety that is thought much of should be grown under varying conditions, so as to meet the various phases of our climate. As a rule, any kind of Pear that will succeed well as pyramid, espalier, or standard should be grown in those shapes. As although a wall gives extra size, it does not always follow that superior flavour accompanies it. Still, whenever walls exist they must be utilized for the fine late kinds that require a better climate and to meet the seasons that are cold and sunless. Every bit of south wall that can be spared or that is not required for the more tender stone fruits should be planted with some of the best late Pears. There are hundreds of yards of south wall in the country occupied with unhappy specimens of Peaches that would be more profitably covered with Pears. The truth is fruits require a rotation as much as, or more than, vegetables, and when one set of trees are worn out on a wall, if the old soil cannot be entirely replaced with fresh, it will be far better to trench it up and plant a distinct kind of tree, and Pears will succeed stone fruits well. And if we could get into the way of looking upon our wall trees more as portable objects, and less as fixtures, I am sure the result would be more satisfactory. Thus, if a tree does not seem quite at home, lifting its roots, or moving it to a fresh site, will generally bring it back to health, and if the first symptoms of derangement are observed and acted on there need be no unhealthy trees. Pears succeed well in pots when grafted *on the* Quince, and the same remarks I have made about Apples on the Paradise are equally applicable to Pears. A collection of Pears in pots will be a most interesting study, and a large number might be sheltered in spring till the frosts were past in a comparatively small house, and then half or two-thirds might be plunged in the open air.

TWELVE GOOD PEARS FOR ORCHARD PLANTING AS STANDARDS.—Bon Chrétien (Williams'), Hessel, Beurré de Capiaumont, Beurré Hardy, Beurré Diel, Suffolk Thorn, Swan's Egg, Thompson's, Knight's Monarch, Marie Louise, Aston Town, and Louise Bonne of Jersey.

A FEW GOOD PEARS FOR PYRAMIDS ON QUINCE.—Williams' Bon Chrétien, Beurré d'Amanlis, White Doyenné, Louise Bonne of Jersey, Marie Louise d'Uccle, Beurré Superfin, Beurré de Capiaumont, Beurré Clairgeau, Beurré Giffard, Ne Plus Meuris, Pitmaston Duchess, Josephine de Malines, on warm soils, Beurré d'Anjou, Baronne de Mello, Fertility, and Beurré Bachelier.

Propagation.—Little need be said of this here, as Pears and Apples are much alike in their nature, and are usually grafted in the same manner in spring. But both Pears and Apples may be budded in summer in the same way as stone fruits usually are, and budded trees are quite as good as grafted ones. The common Hawthorn and other kinds of Thorns have at various times been recommended as stocks for Pears, and probably some kinds may succeed on them, but it is a good many years ago since I first saw it used for the purpose, and in all the experiments I have seen carried out the trees were short-lived. But this is a matter that requires to be taken in hand by some patient, careful experimenter with ample means at his disposal to test the matter thoroughly, not only as regards the common white Thorn, but the stronger-growing Thorns, such as the Cockspur, might be tried.

Referring again for a moment to the question of pot culture for Pears, what an opportunity it would give to the hybridist to try experiments in crossing various varieties. Fertility, size, and flavour might all be probably obtained in the same trees by such a judicious selection of the parents as could be made with a collection of trees of all the best kinds in pots under glass. Most of our fruits have hitherto been raised in a haphazard kind of way, but if the suggestion here thrown out could be acted on, it might be reduced to a system, with many chances in favour of securing any given result.

STONE-FRUITS.

The Apricot.—All stone fruits do best in a deep friable loam of a calcareous character on a dry bottom; and, so far as regards Apricots and Peaches, the protection of a wall is absolutely necessary in our climate. I have seen both fruits just named planted out as standards in several different situations, but the result in every instance has been unsatisfactory. Even the protection of a wall alone does not insure success; other means must be employed to shelter the trees from cold winds and the destroying effect of a low temperature when they are in blossom. The delicate white petals which surround the embryo fruit of the Apricot are more sensitive to cold than the pink flowers of the Peach, and as they generally expand earlier they have more dangers to encounter. I have often seen Apricots trained against a cottage or a barn, or some other out-building, more fertile and healthy than trees growing in the same neighbourhood against a garden wall. Garden walls are often damp, especially where the coping is narrow, or perhaps has been allowed to get out of order, and so let in the wet, and trees trained to a damp surface never seem to thrive well, and are frequently infested with Moss, and more subject to insect attacks than when the wall has been kept in good repair. If walls must continue to be built, bricks form the best material for them, and they should have a substantial stone coping, projecting not less than 3 in. on each side. There is, however, a growing feeling among cultivators that large walled-in enclosures for the cultivation of fruits and vegetables are a mistake; and though I should not go so far as to recommend their removal where they now exist, yet in the case of new gardens I certainly think some of the money spent upon wall building would be better and more economically employed in the erection of plain substantial glasshouses for Apricots, Peaches, Plums, and a few of the choicest late Pears. So far as regards the commoner kinds of fruit and vegetables, better results are obtained in open fields than can be had in walled-in gardens and at a much less cost. For an establishment that has hitherto required a walled-in enclosure some 6 or 8 acres in extent, one-third or fourth of the space would suffice, and this should be chiefly devoted to forcing houses, early vegetables, and salads. The walls should be planted with a few Apricots, Peaches, Plums, Cherries, and choice late Pears, that are not quite reliable as espaliers or pyramids. In many gardens there is more wall space than can be well attended to. To keep wall trees in good order the work is incessant both winter and summer. And too often one or two frosty nights in spring or two or three hours of cold east wind destroy a year s attention. Where walls exist, however, the best aspects should be devoted to the better class of fruits, and though spring frosts and the absence of sunshine in summer destroy the blossoms, yet in the well management of the roots we have a powerful means of mitigating unfavourable climatic influences. Fruit-trees with abundance of healthy roots are not much injured by ungenial seasons; they soon outgrow the withering effects of a cold spring, and their growth being healthier their blossoms are more robust and more capable of standing hardship, and will often even produce a crop when trees less well cared for are barren.

Preparation of the Border.—The first necessity as regards borders is perfect drainage, and even land naturally dry will is a wet season, or during winter, sometimes contain too much moisture for fruit trees; therefore, unless we are quite sure about our position a drain should be run along the front of all wall borders, and have a proper outlet either outside the garden or into a main drain nearer. The second requisite is good soil, such as can be pretty nearly always obtained if the importance of the matter be insisted on. The top spit, 4 in. or so deep, from a common or any position where grass has long grown upon it, and been fed off by sheep or other animals, will suit all kinds of fruit trees. If it is not of a calcareous character, some old mortar or débris from old buildings may be added for stone fruits, as lime is essential for their well-doing. The width of the border should be in proportion to the height of the wall; a 10-ft. wall, for example, should have a 10-ft. border. If we really want to do things well, and to do so is the best and cheapest course in the long run, whenever the subsoil is unsuitable for the roots to penetrate—and deep rooting is an evil even where the subsoil is not really bad—the bottom of the border should be paved or covered with concrete. It is a common practice in some places to plant on a heap of stones, but if a good drain is run along the front of the border, and the bottom is paved or concreted at a sufficient inclination to throw the water to the *drain*, there should be no necessity for planting on stone heaps, which in hot summers dry the immediate neighbourhood of the tree too much. The depth of the border may vary from 2 ft. to 3 ft.; in dry, porous districts the latter depth will not be too much, whilst on retentive soils 2 ft. will suffice. The site of the border should be excavated to the required depth and all inferior soil removed; 4 in. in thickness of lime and gravel concrete should be placed on the bottom and made even and firm, inclining to the front. It need not extend quite all across the border; two-thirds of the distance will be sufficient to give the roots the necessary horizontal direction; and if at any time the feeding extremities should get too deep, they can easily be sought for and brought back. In this matter of border making I intend all I have written here to apply to stone fruits generally. It may not be so urgent in the case of some of the hardier Plums and Cherries, but all who aim at doing things in the best possible manner whenever the subsoil is bad should not begrudge the expense thus incurred. Certain I am, if more pains were taken with the roots of wall trees, they would not be so unsatisfactory, as in too many instances they are. The borders might be prepared in lengths of 50 ft. or so at a time, and as soon as the foundation has had time to settle and get firm, the good soil, if any, from the next section may be run on, and so on all round the garden, bringing in the new turfy soil. When all is completed to make the border up to the proper height, then all should be turned over and intermixed. This work will be best done, say in August or September, and left to settle till November, when the trees should be planted.

The Selection of Trees and the kind of training adopted are most important matters. And I say the same with reference to stone fruits as I have done in the case of Pears. Where the climate and position are suitable to carry the trees on to a good old age and fertility is maintained to the end, then try to get up large spreading trees and plant at wide intervals apart for that purpose. But how few are the places nowadays where large trees are healthy and perfect in outline. How rarely do we find the Apricot wall well furnished. As all stone fruits bear well in a comparatively small state, I should plant them much nearer together than is commonly done. If any particular tree displays unusual strength and vigour, it is an easy matter to remove a neighbour on each side and give it room for extension. Suppose we have a wall, or portion of a wall, 100 ft. long and 12 ft. high to plant with Apricots, and the different fruits should always be grouped together in families if possible, I should recommend ten trees to be planted, which would give 10 ft. for each tree. At the end of half a dozen years the weakest trees could be removed and the others rearranged, so as to occupy the whole space. The fan system of training is that most in favour with cultivators, as it permits blanks to be easily filled up; but stone fruits may be trained in any desired form and in all situations; where the trees are short-lived that system of training is the best which covers the wall with fruit-bearing trees in the shortest time. To do this well thick planting and frequent transplanting is the proper course to adopt. If the wall exceeds 12 ft. in height dwarf trees and standards, or riders as they are commonly termed, should be planted alternately, so as to cover the top and the bottom of the wall at the same time. In the selection of the trees none but those with clean, stout, healthy stems should be planted. A weakly, diseased stock soon succumbs, and if the union is not perfect the tree cannot be long lived. Healthy maiden or one-year worked trees generally turn out well if they are fairly developed both in root and branch; if otherwise, then plant trees two years worked or one year trained. They should be cut back just as the buds are bursting to four, six, or more eyes, according to their strength, but after the first year there should be no necessity, if well managed, for cutting back beyond removing unripe points. It adds to the strength of weakly trees to cut back close, as it confines the force of the tree to few outlets, to which the sap sent up by the roots rushes with greater force, and produces stronger wood; but this is a tendency that, after the first year, should be discouraged, as moderately strong short-jointed wood is best for fruit bearing. As soon as the trees are planted a decision should be arrived at as to the

Mode of Bearing—whether the fruit should be borne on natural spurs on the young wood of the previous year, or whether artificial spurs should be encouraged. The common practice is, in the case of the Apricot and Plum, to take the crop indiscriminately from the young wood as in the case of the Peach, and also to create by pruning a number of artificial spurs on the face of the branches. Both systems have their advocates, but in the case of the Moor Park Apricot, which is everywhere so largely grown, the former plan seems to give the best results. As that variety bears so freely on the young wood in favourable seasons, there is always plenty of blossom. It should be borne in mind, too, that if the blossoms are clustered along the young wood there is less danger of injury from frost, as they lie close to the wall and receive all the shelter possible from its dry, warm surface. I have often noticed in bad fruit seasons, when the blossoms have been sadly thinned by the inclemency of the weather, that in nearly all cases those that remain owe their escape mainly to their contiguity to the wall. A brick wall during the day, if there is any sunshine, absorbs heat, which it gives off again at night, and this accounts for the safety of the fruits lying close to its face, while others on spurs several inches off perish. In commencing the training of a young Moor Park Apricot, if we decide it shall carry its crop on the young wood, we must begin disbudding early by removing all foreright shoots first, when they are not more than 1 in. long and can be rubbed off with the thumb and finger without leaving any scar or wound. In all matters in connection with the management of Apricot trees, which are especially liable to gum and canker if exposed to injury, great care should be exercised that the bark be not injured, either by the careless use of the knife or in the training of the branches. Where nails and shreds are employed, trees are often injured by driving the nails too near the branches, or by a careless use of the hammer, or by drawing the shreds too tightly, or in various other ways. Disbudding should be done gradually, leaving the best placed shoots for bearing the fruit, and always endeavour to secure one at the base of the previous year's shoots, and as many more on the side as there is room without overcrowding, which should be specially guarded against, for it leads to the production of small weakly foliage and badly-ripened wood. Under this mode of training all the pruning that will be necessary, if the disbudding in spring has been properly attended to, will be thinning out the branches that have borne fruit in the summer previous. Some cultivators recommend this to be done in autumn, and though it doubtless does give more room and tend to concentrate the force of the tree upon the remaining buds in a greater degree, yet to insure this to the fullest extent it should take place before the leaves fall, so that their action may help to heal the wounds before the approach of *winter.* When this is done there will be no pruning to do beyond shortening back a weakly shoot, when the annual training and dressing takes place, just before the blossoms expand. It is always a good plan, even where artificial spurs are encouraged, to lay in as much young wood as there is space for; it infuses new life into the tree, and though the young wood close to the wall generally bears the most fruit in a bad season, yet the mixed system of cropping has its advantages, for though the spurs often fail to retain their crop yet they greatly help to shelter the blossoms of the young branches; however this is only a negative kind of benefit, and seems to imply neglect in not affording sufficient shelter by other means. I need hardly say that during the summer all young wood reserved for training on all fruit-trees should, as its growth extends, be carefully secured to the wall.

THE PEACH.

Training.—The fan is the shape commonly selected for the Peach on the open wall, and as cultivators run pretty much in the same groove without troubling about the why or the wherefore of the matter, this shape will probably continüe to monopolize the principal attention. In truth, the young tree generally assumes this shape in the nursery, and by the time it passes into the cultivator's hands, its form has been so moulded and fashioned, the adoption of any other course would lose time. I do not say that the fan is not a suitable or good shape; it has many advantages, doubtless, but it is hardly advisable to be tied down to any hard-and-fast line, though that line may in a general way give good results. I have seen excellent Peach trees with the branches trained horizontally, and with this mode of training there is less danger of overcrowding the branches, which is one of the great evils of Peach culture, and leads to more weakness and debility than is commonly supposed. If we start with a young Peach tree with a main central stem, and lead out young branches at equal distances apart on each side, allowing the bottom branches to keep ahead of the others for the proper balancing of the tree's power; if we take the bearing branches at proper intervals on the upper side of the main branches only, laying in a new set and cutting out the old annually, Peach growing, so far as the training is concerned, is placed on a plain and simple basis; even a beginner can hardly make a mistake or fail to master its details. When the fan shape is adopted there is always a temptation to lay in too much wood, as when a man is disbudding in spring, or pruning later on, any shoot that looks doubtful is almost sure to be left in; and dead wood, both in Peach and other fruit trees might, if all things were traced back to their sources, be often truthfully ascribed to the facility afforded by fan training to overcrowding the branches. It is not easy, in writing about fruits so much alike in character as the Apricot and Peach, to avoid repeating oneself more than is necessary or desirable, and I will state, to save time here, that all I have written as regards the preparation of the borders and selection of the trees in treating of the one will apply to the other, and as the Nectarine is merely a variety of the Peach, I may, so far as the details of its culture are concerned, ignore it altogether. The almost universal system of cropping the Peach is to have the fruit on the young wood of the previous year; and, as a rule, this is the best plan, but there is no rule without an exception. There are cold districts in the north where, instead of the close disbudding necessary for the legitimate carrying out of this system, a modified form of spur pruning may be *adopted* with advantage, for the sake of the shelter afforded and the double chance of securing a crop which is given by it. Of course no one who can obtain all the fruit required by simply laying in a moderate supply of young wood will wish to complicate matters by resorting to spurring. But if, during a cold spring, instead of disbudding so much young growth, some of the young shoots are pinched back to three leaves or so, considerable shelter is secured thereby; and as the spurs generally ripen well they also bear plenty of healthy blossoms. Of course, the spurs must not be shortened back till the wood buds can be distinguished, as Peaches will not swell properly without some foliage on the branches beyond them to keep up the circulation. In writing about the Apricot I drew attention to the absolute necessity for considering well the condition of the roots, and I direct attention to it here because I wish to state still more forcibly that it is quite as important for the Peach. I grant that the Peach is more manageable than the Apricot in good hands. It is not so subject to that sudden paralysis of its vital powers in portions of its limbs, which often causes unsightly blanks in otherwise apparently healthy trees. It will grow and bear good crops of fruit where from some unascertained cause the Apricot does not thrive. It is commonly supposed that the Apricot thrives best in maritime districts, and that it does often thrive well in such districts, I know, but yet the cause cannot be in the atmosphere alone, for I can mention places in the midland counties where Apricots fail in the open air, yet bear excellent crops under glass. Altogether, the matter seems to require further investigation, and I am disposed to think if as much pains were taken with the roots of the trees in the open air as is done under glass, the failure would not be so complete as it has been represented, and in fact in many places is. I have known instances where young trees of both Peaches and Apricots have been planted time after time against walls, from which old diseased exhausted trees of the same class of fruit have been only recently removed, and when this is done without removal of the soil failure must be expected. In planting south walls, a good part should be devoted to Peaches and Nectarines. Apricots south of London do very well on east or west aspects; two or three trees perhaps for a few early fruits may occupy a position on a south aspect, but the greater number should be elsewhere, and if there are any buildings, such as stables, &c., to cover with fruit-trees, let all the best aspects be planted with Apricots. Plant thickly, get the wall covered, then rearrange. In my young days more attention was given to the lifting and rearranging of the roots of wall and other trees than is done now, and that is, I believe, the chief reason why wall trees are not as a rule so well cultivated now as they were thirty-five years ago.

Disbudding.—All fruit-trees that are submitted to pruning and that are growing in a circumscribed space will push more buds than are required, or for which space can be found. And there are no trees that would not be benefited by having the weakly buds that are not required rubbed off as soon as they push forth. But most cultivators are content in dealing with the commoner kinds of fruit to wait till summer, and then cut or pinch back, and in the winter pruning to remove the spurs that are not required. But all are agreed that the Peach should be disbudded, commencing early and going over the trees once a week or so till they have been sufficiently thinned, and the young shoots have attained some size, and can alone carry on the work of the tree. Were the young shoots removed all at once, too much check would be given, and checks of all kinds should be as far as possible avoided. Fruit-trees in our climate will have checks and difficulties enough to encounter without our adding to the number. The first shoots to be rubbed off are the forerights, or those that spring immediately from the front of the branches. Unless it should be necessary to encourage spurs for the sake of the shelter they afford, the forerights should all be rubbed off. The next effort should be to thin out the side shoots, but before this is proceeded with one well-placed shoot near the base of each bearing shoot should be selected for bearing next year's crop; the remainder of side shoots should be gradually removed, until none but those it is intended to lay in are left. In all cases there must be a good shoot at the base and a leader, and others may be left on young growing trees wherever there is space to lay them in without crowding. I have already written something about the system of training the bearing branches all on the upper sides of the main branches, but I know that many good cultivators do not think it matters much on which side of the main branches the bearing shoots are situated provided the tree is well furnished with them in all its parts. But it is best, especially for learners, to work upon some given system that is simple and easily understood. It satisfies the mind and tends to prevent confusion. We will suppose we have an ideal tree, perfect in form—no matter whether it be fan or horizontally trained. As the main branches progress, the bearers are laid in at nearly equal distances on the upper side. The following spring a young, strong bud is developed at the base of each, and by timely disbudding additional force is given to it, and it extends, gathering strength as it advances, and, having space for its foliage, the wood ripens well; the buds bristling along its side are well developed; the blossoms, when they expand, are strong, and there is generally, even in difficult seasons if moderately protected, plenty of fruit to thin off; but usually there is too much young wood laid in. We all seem to wish to have the power of selection, but that power should be exercised when the branches are young. To leave two shoots growing in a space where only one can remain is a waste, as it must tend to weaken both. Disbudding is valuable chiefly because it concentrates the growing force of the tree into just those channels where it can be usefully employed, and all wood the tree carries through the summer not absolutely required is simply so much waste of power. There will of course always be a proportion of young wood to be cut out in the autumn or spring pruning; for instance, the young wood will require shortening back a third or so, more or less, to keep it in its allotted space, and then again the bearing shoots must have a leader; though if the tree be well furnished that leader may, in some instances, be pinched back to 6 in. or 8 in. long; so that there need be no anxiety about there being plenty of foliage on the tree to enable it to carry on a vigorous and healthy circulation. I have dwelt somewhat upon this matter because I am anxious to make it plain; though really it may not matter much where the bearing branches are situated provided the tree is well furnished with them, so that the load the tree carries is so well adjusted that it sits easily upon it, and keeps all the channels of supply in active employment. We know, of course, that the sap from the working of natural laws meets with less friction if its upward ascent assumes a vertical, or nearly vertical, direction, and therefore, according to these same laws, the branches that are trained on the upper side should be better supplied with sap than those which take a downward direction.

Winter Pruning.—As regards the Peach, so soon as the fruit is all gathered, the branches that have borne it, and that will require removal to make room for the next series of bearing shoots, should be cut out. When the sap is in rapid motion the wounds heal quicker, and by the early removal of useless wood more air and light can be admitted to the leaves and buds left to ripen and consolidate, and so induce an early and lengthy rest. As autumn approaches and the leaves show signs of ripeness, some people take a birch broom and sweep them off to expose the wood and bring colour into the bark. To my mind this is a useless operation when applied to trees growing in the open air. When the leaves have performed their work, the agencies Nature employs are quite sufficient to bring them down; and if both wood and buds are not well ripened before the leaves fall, there is but a very poor prospect of maturation taking place after. When the leaves are all down, unnail the young wood and allow the wind to play around the branches. I believe all wall trees would be healthier if these younger branches could be unfastened and permitted a little freedom, even to the extent of waving about in the air so long as no damage was done by abrasion. It is unnatural to tie trees close to a wall and keep them there constantly. Small cause should there be for wonder, if we well considered the matter, if branches die off without apparent cause, or even if trees become debilitated or die off altogether. In February, when the buds are swelling rapidly, the trees should receive their final pruning, but when the old wood is cut out soon after the fruit is gathered there will not be much required beyond shortening the young wood back a little; how much, must depend upon its condition. In all cases the cut must be made just a little in advance of a wood bud to ensure a leader, without which the fruit will not swell properly.

Some kinds, such as the Barrington Peach, are sometimes deficient in wood buds; but in all cases a wood bud must be left to lead. The Peach often produces its buds in triplets, consisting of a wood bud between two flower buds, and it is a safe practice to cut near to buds of this character. Besides the shortening of the young wood, and perhaps the removal of a shoot where too numerous, the scars or remains of imperfectly healed wounds, if any, should be smoothly trimmed up to enable new bark to form over the wound. These scars sometimes remain from the disbudding or summer pruning of the previous year, and if neatly trimmed with a sharp knife they will soon heal up. If left, permanent wounds may ensue, or gumming may take place, and at any rate all inequalities in the bark form a hiding-place for insects. The trees should be trained to the wall before the first blossom expands, but the longer this operation can be delayed with safety the better, as it retards the bursting of the buds, and late blossoming helps to secure a crop.

THE PLUM.

The Plum, as a hardy fruit, comes next in importance to the Apple and Pear; indeed, some may think the Plum should stand before the latter, but Pear culture has hardly yet received the attention at the hands of cultivators it is probably destined to receive. I mean, of course, so far as regards the better kinds of fruit, as the Pear, being a native of this country, has always been more or less planted. I have sometimes seen Plums and Apples planted in orchards indiscriminately, allowing each the same space; this is a mistake, unless the Plums are simply planted to occupy the ground till the Apples come into bearing, and be afterwards removed, as the latter require the space. Plums come sooner into bearing than Apples, and, therefore, supposing the Apples are planted their full distance of 24 ft. apart, Plums of early prolific kinds, such as the Victoria, Orleans, and Early Prolific may be planted between them, to be removed when the Apple trees require the space. But with this exception, and speaking in general terms, Plums should have a part of the orchard to themselves with no other top-growth to interfere with them. If the orchard is well placed for shelter on rising ground—not in the bottom of a valley—Plums are often more profitable than Apples, and I know orchards of Plums that very rarely fail, simply because they are well situated as regards shelter and position; and orchards of this character pay handsomely, as it is when there is a comparative scarcity that fruit realizes the best price. The same care in trenching and preparing the site is necessary for Plums as was recommended for Apples, and the trees should be staked as soon as planted, to prevent injury from high winds. The young trees should be headed back the first season when the buds are showing signs of pushing. Afterwards, as regards orchard trees, the only pruning required will be to remove branches that cross each other, or are otherwise badly placed, as when the tree is thinned out none but bearing wood will be made, and as Plums begin to bear almost immediately, the crop of fruit will soon rectify any tendency to over-luxuriance in the tree. Standards are the best kind of trees to plant in the orchard, and they need not exceed 15 ft. apart; on some soils less will suffice.

Pyramids.—These or the dwarf bush form always realize profitable results, and are especially suitable for garden culture. When well attended to in summer to keep their young growths thin and pinched back about June, and once or twice after if necessary, plenty of fertile buds are formed, and are usually followed by good crops of fruit. Whenever a tendency to over-luxuriance is noticed, the trees should be carefully taken up and replanted, which gives them the required check. Such trees will remain of moderate size many years, and they are therefore well adapted for small gardens. If possible they should have a narrow border or borders to themselves, and be mulched in summer so as to keep the roots near the surface, and maintain them in a continual state of fertility. The spade should be banished from all such borders, as nothing like annual digging by the spade should be permitted; the fork or hoe just to loosen and stir the surface, so as to aërate it, will be all that is necessary. The winter pruning should be confined to removing dead spurs and shortening back the snags left at the summer pinching and thinning. The head of the trees must, of course, be kept thin to let in the sun and air, but the knife should only be used sufficiently to accomplish this object. The greater part of the pruning should be done in summer. Winter pruning often leads to the production of useless wood; summer pruning never does so, provided it be rationally done.

Plums in Pots.—Where an orchard house or cool house of any kind can be spared to shelter the trees in spring while in bloom they usually bear a fine crop. The best time to select and pot the trees is autumn, as soon as the leaves fall, and they should be potted firmly, using good loam slightly enriched with a few crushed bones or a little old manure. The bones are very beneficial for stone fruits, because they are so lasting and do not clog up the soil, and the lime they are ultimately resolved into is especially suitable for fruit-trees of this class. None but healthy, well-rooted trees should be chosen; the roots should be shortened a little where long, carefully trimming with a sharp knife all that are wounded in lifting. In most cases 10-in. pots will be large enough to begin with, and when the potting is finished they should have a good watering with a rosed pot to settle the soil, plunging them at the same time up to the rim in coal ashes, placing 2 in. of ashes under the bottom of the pots to keep out worms. 4 in. or 5 in. of litter, leaves, or cocoa fibre should be placed over the top, covering not only the pots, but the spaces between, to keep out frost, and to preserve an even state of moisture round the roots. Whatever pruning is necessary to improve the shape of the trees should be done when they are placed under cover, just when the buds are beginning to move early in March. Trees so treated will begin to make roots almost immediately after potting, and by the time they are taken to the house they will be fairly in possession of the new soil, and probably some of them will bear fruit the same summer. The pots may be placed almost close to each other until the young fruit are set and the trees are breaking into growth, and by that time a part may be moved to a sheltered corner in the open air, plunging the pots to maintain a regular state of temperature and moisture. The young growths should be pinched when they have made about six leaves, just taking out the points of the shoots. All the shoots need not be pinched at the same time, but, as each shoot requires it, diffusing whatever check is given instead of concentrating it. All the trees may be plunged in the open air if desired, but early Plums are so desirable for the dessert, space, if possible, should be found under cover for a few trees to ripen their crop; afterwards the trees may be exposed to ripen their wood. Abundance of ventilation should be given at all times when the weather is calm and mild, but cold draughts should be guarded against. Plum blossoms are fragile and tender. A dry, buoyant atmosphere should, as far as possible, be maintained when the trees are in blossom; but after the fruit is set the syringe or engine should be used freely to keep down insects and maintain a healthy growing atmosphere. Open the ventilators a little in the morning, gradually increasing the openings for the admission of fresh air as the day advances, and on mild, warm days giving all the fresh air possible, closing the ventilators at four o'clock to take advantage of the sun's warmth, and then giving a little air, more or less according to the state of the weather, in the evening, and leaving it on all night; but as no glass structures are air-tight, very small openings will suffice in a general way during the night to prevent stagnation. At no time must the trees be permitted to suffer from want of water, and as soon as the fruit is set and swelling nicely, weak liquid manure may be given three times a week; top dressings of short manure will in some cases be beneficial and desirable. If necessary, the clusters of fruit should be thinned to insure size and flavour. Overcropping invariably leads to debility and insect attacks. If the syringe does not suffice to keep down insects, which, if properly used, in most cases it will, tobacco fumigation must be resorted to on a still, calm evening—wet evenings are best—shutting the house up closely, damping the paths and floors slightly, but keeping the foliage and young fruit quite dry. It is better to fumigate moderately two evenings in succession than to give an overdose, as young, soft growth may receive injury. Use the syringe freely the next morning after fumigating. Whenever the trees require larger pots, shift them in the autumn, but after they are transplanted into 14-in. or 15-in. pots they may be continued in the same pots for years in a healthy, fertile condition by the aid of rich top-dressings and liquid manure. The pots should be carefully drained as the trees require a good deal of water, and any surplus beyond what the soil can hold in suspension should have a ready means of escape. A collection of Plums may be a source of both pleasure and profit for many years without renewal; indeed, I have always found Plums submit more readily to pot culture than other fruit, with the exception, perhaps, of figs and grapes.

The Pruning is best done when the trees are taken into the house, and at that time a general dressing up should take place, removing (in trees not requiring repotting) all the surface soil that can be got out of the pots, without inflicting unnecessary injury upon the roots, and filling up the space with rich, turfy loam and manure, ramming it firmly down. The compost should be in a nice, dry, mellow condition when used, neither wet nor yet dust-dry. In what is termed the winter pruning, the spurs that have been created by summer pinching should be shortened nearly to the point where fruit-buds are being produced, leaving a wood-bud to lead, but there is not so much necessity to observe this rule with Plums as with some kinds of Peaches, as a Plum branch rarely fails to produce a leader. The manipulation of the growth of Plums in pots is very simple, and may be summed up thus: Disbud where the young shoots are too numerous very early, when they can easily be rubbed off with the finger and thumb. Pinch the points out of the young growths when they have made six leaves, going over the tree, say, twice a-week for that purpose. A few minutes will suffice each time. Pinch all lateral growths to one leaf, shorten back the spurs so formed when the trees are brought into the house, keep an eye to the shape of the tree, and at the same time fill it full of bearing wood, so that the crop may be distributed equally over its surface. With Plums this is not difficult, as they will break out of the old wood anywhere. In pruning make the cuts short and smooth, and to accomplish this well the knife, or whatever instrument is used, must be sharp. I am in favour of the knife for such work, for although the *sécateur* or French pruning shears are excellent instruments for merely cutting through a branch, there are often excrescences on the bark—remains, possibly, of the summer pruning—that should be smoothly trimmed, and which can only be done properly with a knife. All dead spurs or snags that require removal should be cut close to the stem in order to facilitate the healing of the wound, and its ultimate covering over with new bark.

Plums on Walls.—It is well, of course, to set apart a wall for Plums exclusively, and this wall may have an east or west aspect, but in addition wherever there may be a vacancy of only a few feet on the wall, no matter what the aspect may be, and you are in doubt as to what to plant, plant a Plum. They soon come into bearing, and by lifting occasionally a quantity of good fruit may be gathered from a small space. Plant the best dessert kinds on the best aspects, and fill up the north walls with kitchen fruit. Plums make an excellent preserve, and they are always in demand for tarts. And if the young fruits set too thickly in spring, the thinnings may be sent into the kitchen for the latter purpose. From the time the early prolific comes in in July to the time of the Golden Drop and Impératrice in October or later is a good long season, and a suitable selection of sorts will give a continual succession. The Plum is a much hardier fruit than the Apricot, but so far as regards the culture of the choicer kinds on walls both succeed well with the same treatment, and therefore much that I have written on the Apricot may be appropriately referred to when the Plum is under consideration. On a good dry bottom many people dislike going to much expense in preparing borders for Plums. But where the expense of walls has been incurred, it seems much like the proverbial case of spoiling the ship for the sake of saving the halfpennyworth of tar, to begrudge the formation of a good, sound, suitable border. It may, like the Apricot, be made to produce its crop on the young wood, or it may be encouraged by stopping the young shoots in summer to bear on spurs. The common plan is to lay in as much young wood as there is space for during the summer dressing, and also encourage as many spurs along the main branches as can be left without crowding, and no doubt each cultivator will in the future, as in the past, continue to use his own judgment, and be guided by his own experience, influenced in some measure perhaps by surrounding circumstances. Any man taking charge of a place where the trees have borne their fruit mainly on spurs, whatever his own predilections may be, would commit a mistake if he cut off all the spurs for the sake of laying in young wood, as the thing, if done at all, should be done tentatively; anyway, it is always a safe practice in the case of stone fruits to lay in a healthy young shoot wherever it can be done without overcrowding, and then in the course of time, if it be so desired, the old spurs may be gradually removed, and thus new life will be infused into the tree. In the matter of training the fan is a very popular shape, and I may say also that it is an excellent one. It is easily filled up if a branch dies, and it is one that commends itself to cultivators generally for that reason, and because its outline is simple, and, as a rule, simplicity in any matter is a decided advantage, and often leads to its adoption. But the fan shape is not without its drawbacks. It is a long time filling up a wall, and it cannot easily be made applicable for the filling of a small space.

A fan-shaped tree against a wall 12 ft. high must have a considerable horizontal space to give it proper proportions, and as I have been recommending Plums for the filling up of smaller spaces—to, in fact, fill up vacancies anywhere—I should recommend the adoption of the Palmette Verrier, or some modifications of it, for that purpose. The Plum is easily trained in any direction when young, and if we have a space 5 ft. or 6 ft. wide, and 10 ft. or 12 ft. high, and wish to plant a Plum or Pear on it, that is the form of tree I should recommend, and train the main branches far enough apart—say 1 ft.—to permit of young wood being laid in between. I know some people may complain of the cost of the young trees, but there is no occasion to buy trees more than one year trained, or maidens if they could be obtained strong; in fact, older trees would not be suitable.

Pruning Plums on Walls.—It is only necessary to say a very few words upon this subject, and I will begin with the trees when they are bursting into growth in spring. Few people take the trouble to disbud Plums, but when good young wood is required for laying in disbudding is necessary; and in all cases it is well to thin out the cluster of young shoots when they are small, and their removal will not be missed. Young trees, too, in vigorous health often throw out gross shoots, which, if permitted to remain, will rob the weaker shoots, and yet themselves will be useless for fruit bearing. All such shoots should be removed when they are young as soon as their plethoric tendency can be distinguished. As the spring advances and the fruit is swelling, the young wood, if all were permitted to grow beyond a certain stage, will simply carry off the sap that should go to the support of the fruit, and will also, by keeping out the sunlight and air, prevent the fruit swelling properly, and it should be borne in mind that it is not the young, soft leaves that are being formed that gives support to the fruit or brings fertility to the buds next year; it is the older, fully-developed leaves that are carrying on the chief work of the tree. No doubt those young leaves, when they gather substance, will help to perform the work of elaboration, but until that time arrives they are simply wasting the resources of the tree. And after they have arrived at a useful stage they can only help to perform work that would have been better done by the first-formed leaves without their assistance. I have written this much in explanation of the importance of summer pruning. Early in June the trees should be gone over, and the stopping of all young shoots not required for laying in should be persevered with through the summer, not delaying the work for the purpose of having a general trimming up, but going over the trees as they require it. Laterals that start away from the spurs cut back should be pinched to one leaf. Not much winter pruning will be required beyond shortening back the spurs which are the result of the summer pruning. Some may, if they are more numerous than desired, be cut out, but, as a rule, it will be found advisable to cut out old spurs and leave the young ones to take their place, as in this way the blossoms will be kept near the shelter of the wall.

CHERRY ORCHARDS.

The Kentish orchards, when in bloom in spring, are a pleasant sight, and in favourable seasons, when the branches of the trees are borne down with fruit in August, their appearance, at least to the owners, is pleasanter still. Cherries, like all other fruits in our climate, have to contend with cold, ungenial springs, and whoever plants a Cherry orchard, even in the Maidstone district and other favourite parts of Kent, should carefully select and prepare the site for it. Cherries must have a situation free from stagnant moisture. The best position for a plantation of them is on the side of a gentle declivity above the range of cold fogs. Cherries will thrive well in a stony soil if it be fertile; I do not mean gravelly soil, but land which contains a goodly number of boulders, having a smooth, water-worn appearance. I have noticed such boulders lying on the top of the land in some parts of Kent and elsewhere. The necessity for trenching the land as deep as it will bear has been referred to elsewhere, and is an essential condition for all fruit trees. Two-year-old trees, that is those which have been once cut back, are the best to plant, though older trees may move safely if they have been frequently transplanted. It is important for a Cherry orchard to be sheltered from the quarter whence come the coldest winds. Plantations of deciduous trees form excellent shelter, and should be planted, if possible, a year or two before the fruit trees are planted; then by the time the trees come into bearing the shelter will be high enough to render good service. Avoid in all cases deep planting, and stake or secure the trees from wind-waving as soon as planting is finished, and take care in tying the trees that something soft comes between the bark and the tie. A piece of old sacking two or three folds thick is lasting, and answers the purpose very well. The trees must be headed down in proportion to their strength the spring after planting. The distance at which Cherry trees should be planted apart must depend in some measure upon the character of the soil and the varieties planted. I have known trees of the Waterloo variety that would have been crowded at 30 ft. apart, but the Bigarreau on the same soil was none too thick at 15 ft. apart. The best plan is *to plant* thick enough and thin out afterwards, giving the most fertile and best trees the most room. Cherry orchards are best laid down in grass after the first three or four years.

Bush Cherries may be planted where space cannot be found for larger trees, but they will require lifting or root-pruning occasionally to keep them in a fruitful condition. The May Duke, Late Duke, and Morello do well on the Mahaleb, and require less lifting and root-pruning than some other kinds. The trees may be planted in beds or borders about 5 ft. or 6 ft. apart, where some temporary shelter could be erected on the windward side, projecting over the trees 2 ft. or 3 ft. like a coping to keep the blossoms safe in spring. It is not often the Morello is planted except against a wall, but though it does well in such positions, and may be used to fill up blanks anywhere, yet it is also a profitable Cherry to plant either as a dwarf on the Mahaleb, or as a standard tree in any position. The great object to keep in view in the case of dwarf Cherries, especially in rather strong soils, is to keep their roots near the surface; if they are permitted to run down the growth becomes gross, and they either do not produce blossoms, or else the blossoms are imperfect and fail to set. Whenever anything of this nature occurs the trees should be lifted and replanted in autumn. Cherries may be grown in pots, and the remarks I have made about Plum culture in pots are equally applicable to Cherries, and it is a most interesting way of growing them, keeping the trees under the shelter of a glass roof till the spring frosts are past, and then plunging them out or a part of them, in a sheltered corner in the open air. It will, of course, be understood that trees in pots when plunged out-of-doors must be supplied during dry weather with water; and it may sometimes happen that such trees will require water even in a showery time. I have known cases in which potted trees when plunged outside were neglected because gentle showers fell frequently, and the person in charge took it for granted, without troubling to examine them, that they did not require water, when at the same time they were as dry as dust. The light passing showers made no impression on them; in fact, were cast aside by the foliage. All such trees should be mulched to check evaporation, and 2 in. or 3 in. of rich compost, or half-decayed manure, spread over the surface of the soil among the trees forms a beneficial dressing for them.

Cherries on Walls.—In most gardens a wall is set apart for Cherries, though the system of grouping together different kinds of fruits has some drawbacks. The advantage belonging to the plan is that any kind of fruit requiring special treatment can have its wants attended to better when grouped together than when scattered. And such fruit as Cherries that must be protected with nets to preserve them from birds are more easily covered when growing side by side than when separate. On the other hand, there is a decided advantage sometimes in having a tree or two in different aspects, as the May Duke in a sunny position will ripen its fruit a few days earlier than in a less favourable one, while north aspects may be utilized for retarding purposes. This is, however, a question that proprietors of gardens can decide for themselves. I merely throw out the hint because I have met with cases in which a dish of Cherries a few days earlier or later, as the case may be, was appreciated. To prolong the season of any particular fruit is sometimes looked upon as a test of skill, though it is often the result of mere accident. If I had a wall to plant with Cherries, and could take my own course, I should plant the best maidens I could get 7 ft. apart, and should train them as palmettes, allowing seven branches to each tree, laying a young branch a intervals between the main ones. Such a system covers the wall much quicker than any other. Of course time would be gained if young trees, started in the nursery as horizontals, could be obtained, but they cannot always be bought. The advantage of buying maidens is they cost less money, and one can adopt any system of training one likes. There is, perhaps, less necessity for laying in young wood in the case of Cherries (always excepting the Morello) than in that of other fruit-trees, as Cherries bear so freely and well on spurs. But the fault belonging to the large old trees with which one sometimes meets is (especially if they are growing on heavy soil that has received but little preparation) the centre, in the course of time, ceases to bear, and many feet of wall become virtually barren. With a good broad border well prepared, warm and dry, this, however, will not soon happen. I feel that the right course to adopt, on indifferent soils or in places where the expense of border-making cannot be allowed, is to plant the trees closer together than is usually done, and keep the roots near the surface. Trees with their roots near the surface do not make gross shoots, which when cut back are converted into large ugly spurs that are often flowerless; or if a few blooms appear they do not set properly, and consequently fall off without ripening. Those who have such trees on their walls must of course do the best they can with them, and that is cut out every alternate branch and fill the spaces thus left vacant with young wood as soon as possible, avoiding overcrowding. In this way barren trees may be made fertile. The summer management of the Cherry in a trained condition on walls consists in stopping the young wood, beginning towards midsummer, and cutting back to about four or five leaves. In summer pruning some cut the young wood back too close, not only in the case of Cherries, but also in that of other fruits, and, as a consequence, the buds that might in due course be converted into flower-buds are compelled under the excitement of vigorous root-action to burst into growth. If another leaf or two had been left on the spurs a little more scope for root-action would have been left, and at the worst only the buds at the extreme end of the spurs would break; the others at the base would remain dormant, and if sun and air had free access to them something useful would be the result. There is an advantage in dividing all summer pruning, whatever the fruit-tree may be, into three periods, doing the top first, then the centre, and lastly the bottom. Thus the top, which is usually the strongest, is denuded of its foliage first, and the bottom, which is nearly always the weakest, by being allowed to carry its surplus foliage a fortnight longer, draws to itself a larger portion of sap, which materially helps to preserve the balance of the tree. The winter pruning of the Cherry consists in shortening back the young wood left as spurs and cutting out all dead and useless spurs. The young trees that have space to fill up may, if their roots are near the surface, have their shoots laid in full length, and thus the wall will be more quickly covered.

The Morello is usually employed for furnishing north walls, not because it does not succeed in any other aspect, but it thrives so well in all inferior positions where choicer fruits do not ripen well, that some have been led to consider a north wall necessary for its culture. It will, however, grow in any position, and I have already adverted to its use both as a standard and also a pyramid on the Mahaleb stock; in short, the Morello will thrive wherever other Cherries do well. In its growth and mode of bearing this Cherry somewhat resembles the

Peach. It has the same slender flexible branches, and produces its blossoms, if the wood be strong and firm, in the same way; indeed, in most gardens, the Peach-tree is taken as a model for the Morello, and I do not think any better system of training or pruning can be suggested. I have seen Morellos occasionally spur-pruned like other Cherries, but the trees have not to my mind been satisfactory. Their branches should not be too much crowded. More and better fruits will be obtained by training the bearing shoots not less than 4 in. apart than when, as is commonly done, they are laid in much thicker. The disbudding and thinning should be done early, and those left for bearing should be tied or nailed in or be fastened back to the wall by means of slender twigs of privet, or of any other tough shrub. The same plan is often pursued in the case of Peaches, and it saves material and avoids driving nails into the wall, which would have to be drawn out again in autumn.

HEADING DOWN OLD TREES.

In the case of all trees, whether grown under restriction or free from restraint, there comes a time when growth nearly ceases, or at least the growth made lacks vigour, and the power and stamina of the tree seem to have deserted it, the bark loses its natural healthy colour, and the whole tree has a decrepit, hide-bound appearance. Though it still continues to make foliage the leaves lack substance, and look puny and sickly. When this stage is reached the common practice is to dig it up and plant a young tree in its place. From want of a little discrimination many a tree with a good deal of useful work in it has been thus condemned. Of course no one can bring the dead to life, but if the symptoms are simply those of exhaustion, and there is no canker or decay visible, cutting the head off will very likely restore it to health; at any rate, I have seen the plan succeed so often that, even in doubtful cases, it is worth a trial, as, should it fail, there is only one season lost. Let us suppose there is an Apricot, or Peach, or Plum growing against a wall; for several years it has borne but little fruit, and that little has been small and inferior; it still produces blossoms, but they fail to set, or, if they set, they drop in the stoning. The best thing to do is to head it well down, for the old channels up which the sap has flowed have become contracted, and we must get as near the source of supply as possible, therefore do not be afraid of cutting down low. It is a drastic remedy, which will either kill or cure. If the tree has vigour enough left to stand it, a long useful period will be added to its life; but if it succumbs, it will simply be terminating a useless existence; the tree must, however, be very far gone if this kind of treatment does not bring it round. The roots should be examined either the season previous to the operation or the season afterwards, lifted, and brought nearer the surface, and some fresh turfy loam should be put round and amongst their feeding extremities. Crushed bones and soot are excellent stimulants to apply at the same time, as they do not clog up the soil in the same way that farmyard manure does, and they impart a wonderful vigour and substance to the leaves, and a tree with puny foliage cannot bear good fruit. A tree headed down, if its roots have been attended to some six or twelve months previously, will often bear a good crop within two years after heading down; therefore there is very little time lost. It is generally thought that the only time when root-pruning or lifting can be done is in autumn or winter, and although I shall not recommend any tree that is bearing a good crop to be interfered with in summer, yet, in the case of the trees under consideration, I should prefer to lift their roots and give them their supply of new food in summer, say about June or July, doing the work if possible on a cloudy day; or if that cannot be done, I would erect a temporary shade till the roots become active enough to supply the foliage. When the earth is warm, roots brought up from a colder stratum to within 1 ft. or so of the surface laid in good fresh earth strike out at once and have a marvellous effect upon the tree for which they cater. Of course performing such work in July requires more thoughtful attention than where there is little or no demand made upon the roots. The syringe or engine must be frequently employed to keep up the foliage till the roots become active, and the border should be mulched with half-decayed manure.

WATERING AND MULCHING.

I need scarcely say that there are periods in summer during sudden bursts of bright sunshine when a good supply of water would be exceedingly beneficial to all kinds of fruit-trees, especially those trees growing against a wall. In such a position they often fail to obtain their fair share of the passing showers in summer; and even if they do obtain it, the higher temperature they are exposed to renders an extra supply at times necessary. The fruit from well-nourished trees is always finer and better flavoured than from starvelings. It seems to be a necessity in making the most of a garden to crop the wall borders with vegetables. No one doubts that the trees would do better without another crop growing in the soil appropriated to them and consuming their food. But, somehow, nearly everybody practises it; it also necessitates digging and manuring, both of which operations have a prejudicial effect upon the well-being of the trees. Failing to secure the whole extent of the borders for the roots of the trees, most of the best cultivators adopt a sort of compromise—that is, the front half of the border is planted with early vegetables and salads, and the back part, from 4 ft. to 5 ft. in width, is left uncropped for the double purpose of leaving some portion of the roots undisturbed, and giving space to attend to the trees in the regulating of the summer growths and other matters that require frequent attention. It is not good policy to dig the borders immediately over the roots of fruit-trees in winter; better leave it till March, and then dig the front portion and lightly fork up the back. This stirring the surface at that season lets the sun and air into the border to sweeten and warm it and increase the activity of the roots. As the season advances, and if dry weather sets in about June, a mulch of half-rotten manure over the roots of the trees will keep out the drought and nourish them, and the waterings that will be given when necessary will not evaporate so rapidly. In addition to fairly copious supplies of water to the roots, the garden engine should be used to wash the foliage in the evenings as often as possible. Water, if it could be given often enough, applying it through the engine with some little force, would cleanse the trees from insects and add immensely to their vigour. Unfortunately, this work is woefully neglected; either from lack of time or indifference the garden engine is not half enough used. It is more necessary in the case of Peaches and Apricots than other trees, but all wall trees would be immensely benefited by it. Trees growing under the shelter of copings do not get so much assistance from passing showers as if they stood fully exposed; therefore it is incumbent upon all cultivators to make good the deficiency, and to do so with a liberal hand; this is, in fact, one of the matters that cannot be overdone. When the month of March comes round again the decayed mulch should be spread over that part of the border that is cropped with vegetables, and be dug in. Dressings of soot and lime or chalk may be applied to the borders of fruit-trees just previous to surface-stirring any time. They are very useful stimulants, and do not clog up the soil.

INSECTS AND DISEASES.

In some soils stone fruits are very subject to the attacks of aphides of various species and colours, but I have elsewhere alluded to the desirability of keeping up the tree's stamina, as the best antidote to insect attacks, as if it does not act as a preventive, the attacks will be lighter, and consequently easier to deal with. There is something in the juices of a weakly, debilitated tree that the aphides like, for no sooner does a tree get into bad health, than they swoop upon it in myriads. But that is a law of Nature, and is not confined to vegetable life only; the weak are ever preyed upon by their enemies. But there are causes at work in spring, when the growth is tender, that makes it necessary to keep a watchful eye for aphides even when the trees are vigorous. A few days of cold, biting, east wind in April or May checks and stagnates growth, and whenever a check is felt, insects will soon appear. I have often wondered where they come from in such vast numbers. The trees may be clean and free from their presence, but, get the wind in the least to chill and cast a blight on everything, and the insects, as if they had been lying in wait for a favourable opportunity to attack, appear in myriads.

No doubt their eggs had been snugly hid away in the holes of the wall, in cracks and crevices of the bark of the tree, in the folds of the shreds, and wherever a warm hiding-place could be found. To deal successfully with insects, we want to ascertain something of their habits and mode of living. When we know that they are hid up in winter in a particular spot, and that they cannot help themselves, we have them somewhat at advantage if we attack them then. Thus, wherever the trees are infested with insects, we may lighten our labours by washing the wall with a solution of soft soap or Gishurst Compound, in which a wineglassful of paraffin oil to the gallon has been blended; the soap and oil should be mixed first. The trees and the shreds should be unnailed and renewed. All the old ones that are in good condition may be used again after they have been scalded with boiling water. The trees should be washed with Gishurst Compound, from 6 oz. to 8 oz. to the gallon, well incorporated with the water. A brush should be used for the strong branches on which are no buds, brushing the solution well into the cracks and crevices. This thorough cleansing when growth is dormant, with the use of clean training materials, whether the branches are nailed or trained to wires, enables us to commence the season hopefully, and generally delays the attack till the blossoms are set, but not always; sometimes, in the case of Peaches, a few flies appear on the young shoots before the flowers have begun to fall; when this happens, a little tobacco powder puffed among them will keep them in check; in fact, tobacco powder is the only thing I have used for many years for early application, till the weather becomes warm enough to employ the engine, and then a good supply of soft soap and water, used on the principle of prevention rather than cure, is all that is necessary. The old adage may be extended, for in our attacks upon insects "a stitch in time saves many more than nine."

The Black Aphis is the most difficult to kill, but I have never known tobacco powder to fail in its eradication; but it is powerful, and the young shoots should not be dusted too heavily with it, or it may injure them. It is best used in the morning, just before the dew has all evaporated from the foliage. In addition to the Peach, the black aphis attacks the young growth of Cherries; fastens upon the young soft leaves at the ends of the young wood. This fact often assists us in destroying them, for the young shoots may be bent down and dipped into a basin or bowl containing a strong solution of quassia chips, 3 oz. to the gallon, or soft soap and tobacco liquor, 4 oz. of the former to 1 quart of the latter to the gallon of water; but, as the strength of the materials sometimes varies, it will be better to try anything that is being used for the first time at different strengths, until it is found suitable for destroying insect life without injury to the vegetable existence; and the syringe or engine should be used frequently, charged with clean water. Next to aphides come the

Red Spider and the Scale, but the latter can be dealt with by winter dressing with Gishurst Compound, and the same, or soft soap in solution with some sulphur added, will tend to prevent the appearance of red spider. The latter insect is such an insidious little fellow; he lies ensconced in the wall, or hid away in the axils of the buds, or in the folds of the shreds till the summer comes, and when, under the pressure of a week's hot weather, the forces of the tree begin to wane, and the opportunity he has been waiting for has arrived, out he comes and takes advantage of it to the full, and unless his work is discovered, and remedial measures taken immediately, many of the leaves may be honeycombed and destroyed in a week, and no tree can go through such an ordeal without its general health suffering. Had the trees been kept moist at the root, and had they been washed occasionally in the evening with clean water, there would probably have been no attack; for red spider, like all other spiders, dislike cleanliness, and water is an abomination to them. In writing this section upon insects, I do not intend to speak upon every insect that may occasionally visit our fruit-trees; I am only taking the case of those that are most destructive, and if the measures we adopt are sufficient to keep off the greater evils, the lesser will not do harm. There are maggots and grubs, the larvæ of various moths, that will coil themselves up in the foliage, but these can easily be destroyed without much damage being done; it is the insects that breed so rapidly, such as aphides and red spider, that are usually so destructive, and it is against them that special precautionary measures must be taken. Next in importance in the list of enemies to the fruit-growers are the curls, blisters, blights, and mildews, or whatever name the various maladies may be commonly known by. The curl or blister is most probably caused by cold currents, as it is never found on trees under glass, and very rarely found outside in sheltered situations. It is only to trees exposed to cold winds that it really proves injurious. And it is to shelter and better root-action—as the root-action is probably weak and sluggish—that we must look for its removal. It has been thought by some that it is caused by insects or mildew, because these are often present on blistered leaves, but they are rather an effect than a cause. The best course to take with trees that are badly blistered is to pick off the worst leaves, and syringe frequently with soft soap and water, to encourage clean, healthy growth, and adopt some effectual system of affording shelter during the prevalence of cold, easterly winds; at the same time lift the roots and bring them near the surface, placing some mellow, turfy loam within their reach to stimulate healthy root-action.

Mildew is often present with blister or curl, and may arise from nearly analogous causes—viz., sudden changes of temperature, producing stagnation to the vital forces of the tree. Sulphur is the acknowledged remedy for mildew in all cases when it attacks vegetable growth, and it may be applied by dusting it on the part affected, or be mixed with water and applied with the syringe or engine, and if one application does not suffice follow up the practice till the mildew is destroyed. Gumming and canker will sometimes attack stone fruits, especially Cherries and Apricots, more rarely Peaches and Plums. Various causes have been assigned for it, but in my opinion it is caused principally by deep rooting or by planting in rich soil, thus gorging the sap-vessels and producing an unhealthy, plethoric habit. Very rapid growth in young trees is not an unmixed good, and it is in those cases I have seen the greatest amount of gumming and canker, and when a tree is affected with gumming in its early career, it takes a long time under a careful *regimen* as to diet before the evil can be cured. When gumming follows some local injury to the bark, although that injury may be the proximate cause, it is not often the real one. If the tree had not been acted upon by predisposing agencies, gumming would not often follow a mere bruise or fracture of the bark.

Much discussion has at various times taken place in the horticultural press as to the action of

Galvanized Wire upon the young wood of Peaches trained on it, and that in some cases injury has resulted from its use there cannot be a doubt. But if we grant this we must still ask the question, How is it that it does not always have the same effect? as galvanized wire has been used in many places with no such bad result. I remember a good many years ago—for this galvanized-wire question is no new one, though it comes up fresh every year or two—I was speaking to a manufacturer about it, and, though I do not remember his exact words, the impression left on my mind is that there are various qualities of galvanized wire, and whilst some may be perfectly harmless others may be injurious. Even supposing this statement to be correct, it is only a negative kind of comfort unless we possessed some infallible means of telling the harmless from the injurious; but I should think it would pay some firm of manufacturers to make a genuine article that could be guaranteed to be harmless to growth, as this fear of its injurious effects prevents many from using it. There may, of course, as I have already hinted, be trees predisposed to gum. Some may be constitutionally liable in the same way that families in the human species may be subject to gout or other complaints. In discussing the ailments of fruit-trees, perhaps the most difficult thing to do will be to assign a convincing cause for the

Sudden death of large branches of Apricots.—Old and young, all are liable to this disease. A tree may be apparently healthy, and all at once, without any cause so far as we can see, a large limb, perhaps all one side the tree, may die and have to be cut away, but the most marvellous thing about it is, no sooner is the mischief done than the trees set about repairing the damage, and in most cases the space will soon be filled up again with new healthy growth. The only way I can account for it is the tree receives some severe shock. It may be drought, or something equivalent to a sunstroke in the human family; it may arise from carrying too heavy a load, overtaxing its power, or anything else that puts a severe strain upon the forces of the tree's life, so as to cause a weakening or a paralysis of its powers. I never remember to have seen this take place with trees cultivated under glass, and if it did I should expect it to arise from the same causes. Apricots are generally very thrifty when planted out in a cool house with just the smallest possible amount of artificial heat to make the blossoms safe on cold frosty nights in spring, and abundant supplies of fresh air at all favourable seasons. The only suggestion I can offer likely to have any preventive influence in the case of branch-dying is to plant in sound healthy loam without manure. Don't crop the borders, and be content when the trees are young with a moderate annual growth. Very rapid growth in youth generally involves some sacrifice in after years. The presence of lime in some form is necessary to the health of stone fruits. It moderates, hardens, and strengthens their growth, and dressings of lime or chalk should be given when necessary, scattering it over the surface of the border in spring and lightly forking it in.

PROTECTING THE BLOSSOMS.

It must be obvious that no one universal system of protection will suffice for all places; the climate of these islands varies too much. There are sheltered situations where the smallest amount of protection will make all safe; just a few small sprays of yew with an old fishing-net hung over, to keep the wind from displacing them, is all that is required, and will be better than heavier coverings; but it would be the merest folly and presumption to say, because such and such a thing has been very successful in one situation it must necessarily be so elsewhere, where the conditions are totally different; yet, making every allowance for the many varying circumstances under which fruit-trees are grown, and taking a general view of the question, I do think that very often the protection does harm; it is in the nature of things that it should do so. The trees themselves are fairly hardy in our climate when planted against a wall; it is the blossoms that need protection, and the problem to be solved is just to give as much shelter as each case requires and no more. We may leave out of the question a glass roof, as that would remove the case to another category altogether. The first requisite in a wall is a dry surface; a wall that is always damp and green with moss is not fit for fruit-trees. Not only do damp walls act prejudicially upon the blossoms, but the wood in a dull, sunless summer does not ripen so well. Every wall should have under the grooved edge of the coping a small zinc gutter to carry off the water that runs from the coping and drips down on the trees. This drip in cold weather must be bad for them. When referring to the protection of Pears, I said something in favour of movable temporary copings that would fold back on the wall, and it is still more important in the case of stone fruits. What is required is protection from frost, cold rains, and winds from the time the blossoms open till May 10, and, as during that time there are days when the weather is exceedingly mild and warm, permanent or immovable copings reaching far out from the wall must tend to weaken the trees and make them more susceptible to insect attacks. I don't consider any coping, whatever the material may be of which it is made, is perfect, except it can easily be folded back when the weather is warm, for the trees to have the full benefit of exposure. Glass is a perishable substance and easily broken, and I have an idea that a light frame made to work easily on hinges in suitable lengths, and thatched with a single layer of reeds, would be cheap and effective. The reeds could be cut to fit the frame, and be secured with a thin lath. It should be made from 12 in. to 18 in. wide, to suit any locality, and might, I think, be easily secured to the stone coping. The misfortune of fixed copings of glass or wood is their tendency to weaken by over-protection. If a space was left between the temporary coping and the wall for ventilation the effect would not be so bad, but in any case I do not look upon fixed copings as anything but a makeshift, as I believe some better mode of protecting trees will be discovered if fruit-trees are to continue to be grown in the open air. What we seem to want is something cheap, and what any ordinary man can make. If we are to go to the expense of glass copings, we might as well cover the trees with glass altogether, and feel safe at once, as the expense of glass copings, canvas curtains, and supports will go a long way towards paying for it; but, as I have already said, the thickness and character of the protection should vary with the locality. Why should any of us go to an unnecessary expense if we can secure a crop of fruit with sprays of evergreen or deciduous trees or shrubs and a few old fishing-nets hung over? and I know some who do, indeed, they oftener have a crop than do those who cover more elaborately; but then, of course, there may be something favourable in their locality—their trees may be possessed of more than average health and vigour. This, I believe, is true, and strong healthy blossoms will stand more cold than weakly ones. In looking at the question from all points of view it seems to branch off into a good many distinct issues, most of which are intimately connected with the general system of culture, and may be, I think, briefly summed up as follows:—1st, plant the young trees in a suitable border; 2nd, keep them free from insects; 3rd, give them water in dry weather, both over the foliage and at the roots; 4th, keep the young wood thin, so as to get it well ripened; and 5th, in spring adopt some cheap simple system of covering that does not coddle the trees, and which at the same time suits the locality; and lastly, keep the walls in good condition, so that they may always be dry and warm. I believe in the majority of situations a light movable coping 1 ft. wide, with a few sprays of yew placed in among the branches of the trees, so that their feathery ends may project a few inches from the wall, will be sufficient, and in fact answer the purpose better than heavy curtains flapping about in the wind. Looking back at the time when flued walls were in operation, and noting the good crops of fruit then gathered from them, the idea constantly comes into one's mind, why have they been neglected? and why cannot we hark back to them again? Depend upon it, the step will be in the right direction, only instead of flues we should substitute hot-water pipes.

SELECT STONE FRUITS.

APRICOTS.—Moor Park (the best for general planting), Hemskirke, Peach, Oullin's Early Peach.

CHERRIES.—Bigarreau, B. Napoleon, Black Tartarian, Governor Wood, May Duke, Early Rivers, Knight's Early Black, Holman's Duke, Morello, Kentish.

PEACHES.—Royal George, Noblesse, Hale's Early, Vanguard, Grosse Mignonne, Walburton, Admirable, Lord Palmerston, Broughton, Crawford's Early, Prince of Wales.

NECTARINES.—Downton, Elruge, Hardwicke Early, Pine Apple, Violette Hâtive, Pitmaston Orange, Hunt's Tawny.

PLUMS.—*Kitchen Varieties.*—Belle de Septembre, Victoria, Diamond, Early Prolific, Orleans, Goliath, Magnum Bonum, Pond's Seedling, Prince of Wales, Damson, Winesour. *Dessert.*—Transparent Gage, Green Gage, Golden Drop, Impératrice Blue, Jefferson, Kirke's, Reine Claude de Bavay, Washington, Angelina Burdett, Rivers' Early Favourite.

Propagation.—Peaches, Apricots, and Nectarines are best propagated by budding upon the Plum. There is some difference of opinion as to which is the best variety for the purpose, and I am not called upon here to decide the question as to whether the Muscle Plum, the Pear Plum, or the Brompton stock is best; perhaps for certain purposes and situations all are good, but the subject is too wide to be discussed in all its bearings here. Budding is a simple, easy process of propagation; any one can master its details, and it is not like grafting; there is not much fear of being too early or too late, as it can only be done when the bark will move easily. In budding, the stock is not headed down, but a smooth place is selected at the proper height, preferably on the side furthermost from the sun, so as to be removed from its drying influence. There are two modes of manipulating the opening in the bark of the stock for the reception of the bud; one is to make a perpendicular cut just through the bark, but without injuring the wood, about 1½ in. or 2 in. long, lifting up the edges of the bark a little on each side to permit of the easy ingress of the bud and its shield of bark. The other method necessitates a transverse cut at right angles with the perpendicular line and about ¼ in. or so below its upper limit. The object of this tranverse cut is to facilitate the operation of budding by permitting a little wider opening of the bark, and a rather freer, easier insertion of the bud. The less the bark of the stock is mutilated the better, and that is undoubtedly the best system which permits of the operation being done with the least amount of injury. The buds should be selected from healthy, fruitful trees only, and should be sufficiently advanced without being too forward. The experienced budder can generally tell by the feel of the wood when the buds are suitable. The time does not arrive in all cases at the same moment, but there is a time when the young wood begins to lose the flexibility or elasticity of its early growth, and is gradually merging into the firmness or ripeness of autumn, and it is at this point when about midway between the two that the bark and the buds are generally in the best condition for removal. The buds must be carefully tied in with soft matting or soft material of some kind, which must be examined and loosened when the buds commence to swell—generally about a month or so after the operation has been performed. In nearly all cases the buds will remain dormant till the following spring, when, as soon as they begin to move, the stock should be headed down to within 2 in. or 3 in. of the point of insertion; as the young shoot springs rapidly up, the projecting stock may be used the first summer for supporting it, by linking the two together with a bit of soft matting. Some care is necessary in raising the bark for the insertion of the bud, that the inner bark or cambium be not injured or disturbed, as success in budding depends chiefly upon the eye of the bud coming into close contact with and resting firmly upon it. It is also important in extracting the wood from the shield of bark surrounding the bud that the eye of the latter be not torn away, and to avoid this, the leverage or force should always be to the lower or base end. The head of the stock must be neatly pruned away when no longer required. All through the summer all growths upon the stock other than the bud inserted must be removed as soon as formed, and it may be desirable to pinch the young shoot of the bud itself when it has made a fair amount of progress in order to strengthen the base. Cherries and Plums are best budded upon stocks of their own species in summer, though in their case grafting may be resorted to if budding has been neglected or delayed too long. The Mahaleb is a good stock for inducing early fertility, especially for warm soils, and the Morello is not without its advantages.

FRUIT-TREES ON OUT-BUILDINGS.

We build walls specially for fruit-trees, and too often neglect the warm dry walls of both dwellings and out-buildings, which are far better in every respect for their culture than garden walls which cost so much to build, and which, somehow, are often very imperfectly furnished. One of our national failings is the indifference with which we look upon small matters, a fact which is apparent everywhere. The farmer ploughs, cultivates, and manures well the centre of the field, but the headlands, the approaches, and the odd corners are neglected. So it is in regard to weeding; much labour is bestowed on keeping crops clean, and yet the hedges and ditches are allowed to be full of nettles and thistles, the seeds of which are scattered abroad to make work for the following year. Thus, year after year, we go on and never think of breaking away from the track to which we have become accustomed. I have often thought when looking at the blocks of modern farm-buildings now common everywhere, that a good deal of fruit might be grown on their outer walls. The manufacturer is compelled to work up his waste to enable him to realize a profit in these days of keen competition, and the farmer, if he is to hold his own, must turn everything to account, and among other things that the future has in store for us is the utilization of farm-buildings for fruit-culture. Pears should occupy the southern and eastern aspects, and Plums and Cherries the north and west.

Pears for Planting against Buildings.—Beurré Bosc, Brown Beurré, Bon Chrétien (Williams), British Queen, Passe Colmar, Doyenné du Comice, Jargonelle, Louise Bonne of Jersey, Marie Louise, Fondante d'Automne, Uvedale's St. Germain, and Hacon's Incomparable.

Plums.—Prince of Wales, Golden Drop, Magnum Bonum, Pond's Seedling, Denyer's Victoria, Reine Claude de Bavay.

Cherries.—Morello and May Duke.

Some pains should be taken with the site before the trees are planted in order to give them a good start. A well-drained bottom is absolutely necessary; and another essential is 2 ft. in depth of good soil. I do not wish to complicate matters by multiplying details, which nine out of every ten who plant fruit-trees ignore, but these two points must be insisted on, and there will be less difficulty in this case than is usually met with.

Country homesteads either are or should be well drained. They are generally built where a good outfall can be secured, so that, if it should be necessary to put in a short drain or two along the base of a wall to prepare a border for fruit-trees, very little labour will do it. Then, again, if any of the soil should require changing, there are horses and carts on the place, and some day, when other work is not pressing, some unsightly ridge or bank can have the turf skimmed off 3 in. or 4 in. thick, chopped up, and carted to form a fruit-border. The bank can then be levelled and sown thickly with grass-seeds, and so two useful improvements will have been carried out at one and the same time. If in a dry, warm season the trees require support, a hose from the liquid-manure tank will supply it readily.

GABLE-ENDS AND WASTE WALL SPACES.

When we look around us and see the immense strides which the culture of fruit-trees has taken, both in this country and on the Continent, during the last quarter of a century, we are apt to imagine that the art of growing fruit has not only arrived at its highest perfection, but that it has also reached its very fullest extension. If, however, we look a little more closely into the matter, we shall find reason for reconsidering this too favourable verdict. For many years past we have heard around us nothing but speculations as to where fruit-trees should be grown next, such has been the spread of fruit cultivation both under glass and in the open air. Many, however, believe that large planters of fruit-trees will, in time, have to transform their superabundant material into pea-sticks, props, and other supports; but these are false prophets who do not seem to realize the fact that the taste for growing fruit is becoming more and more popular every day, and that the system of high culture, although it does not limit the number of years of production, shortens the existence of the tree, and that the crowded plantations of oblique, vertical, crossed, and U-shaped cordons, so justly and generally adopted now-a-days, require a larger number of trees than the old system. But what the greater majority of that class fail to see is that there are great numbers of wasted positions which could be easily utilized for fruit-growing. The Belgians have justly earned the reputation of not leaving a single corner of their country uncultivated; and one of their number, M. Burvenich, Professor of the State Horticultural School at Ghent, urges that the gable-walls of buildings of all kinds might be much more freely utilized than they are for growing fruit-trees, and that, too, with a minimum of trouble and expense. M. Burvenich has already done good service to the cause of fruit-culture by strongly advocating, both verbally and by means of his pen, the advisability of planting school playgrounds with fruit-trees, and his efforts have met with successful responses in numerous cases. In a small pamphlet, published at Ghent, M. Burvenich gives a description of his system, of which the following is a translation :—But (asks our author, speaking of his own country) are there no other waste places where we can grow fruit-trees? What numbers of school-yards are there not open to fruit-tree plantation now that the question, which has been examined both from the schoolmaster's and cultivator's point of view, has been solved by numberless favourable results. When there are no more orchards to plant, when all our school playgrounds are full of trees laden with fruit, under the welcome shade of whose foliage the school children disport themselves, when the country roads are bordered with fruit-trees, as in France and Germany, when the meadows shall be intersected by rows of Pear-trees, we shall still not have too many fruit-trees, for the gable-walls of our houses, farm-buildings, barns, stables and coach-houses will still remain at our service.

In the case of farms, communities, villas, and cottages, even those inhabited by farm-labourers or workmen, there is generally at least one wall, if not more, which will serve for fruit-growing. These wasted, or little used gable-walls are specially suited to fruit-culture, and if used for growing properly selected kinds, will yield their proprietor a large profit. By training fruit-trees against the gable-walls of houses, there is no need to fear the drippings from the roof, which so injuriously affect fruit-trees trained against the side-walls of houses unprovided with gutters. It generally happens, too, that the soil being almost in a virgin condition, is naturally favourable to the growth of the trees. In such situations the soil is generally rich, and is (as a rule) made ground, having been well disturbed and turned over in digging the foundations of the building, besides being frequently mixed with lime-rubbish, one of the most favourable ingredients in a soil intended for the growth of fruit-trees. The triangular form of the gables themselves also will naturally equalize the espaliers which are proposed to be trained against them; besides which, these gable-walls being pretty extensive would allow wide-spreading, tall-stemmed espaliers.

The utilization of gable-walls offers another advantage which is particularly important, inasmuch as they are not only useful as a new source for producing fruit for the market or shop, but still more for good stock fruit, of which there is generally a great scarcity amongst consumers, and which besides yields a large profit to the grower, being sold at so much per fruit and at a high price. It would be wasting time and the space at our command to discuss at any length the difficulty of growing stock fruit in the open orchard or field in which the trees are exposed to the inclemency of the weather on all sides. If the blossoms escape being destroyed or injured by the cold of late springs, and the fruit does not spot or crack in summer, we have still to dread the equinoctial gales in September, which bring to the ground even the most vigorously grown fruit at a time when they require at least two months' additional ripening. The system we are advocating is not only meant to be adopted as a means of procuring a few early Pears or Apples, but to effect a much more solid improvement in fruit-growing. It is intended, as may be easily perceived, to produce results very much greater than can be obtained in the orchard on the one hand, or in the fruit-garden on the other. It is clear, however, that it is only those gable-ends which are exposed to the proper aspect which will yield a superior result, those which are not so favourably situated as regards sunlight being reserved for early sorts of good quality.

CULTIVATION OF THE PEAR ON GABLES.

Choice of Sorts.—Of all fruit-trees the Pear-tree is the best fitted for this form of culture. It is easily grown, always succeeds, allows itself to be trained into almost any form, and yields fruit which always commands a ready sale. It may be grown in almost any soil, and produces varieties which suit almost any aspect. Thus, for a gable-wall, with a southerly, south-easterly, or south-westerly aspect, a high-stemmed espalier of the Doyenné d'Hiver is most suitable, without, at the same time, excluding several others, the names of which will be given farther on. We propose this kind, however, for the object we have in view, because it is one of the very late Pears, besides being of excellent quality, and always commanding a ready sale in the market. It is well known that neither the Doyenné d'Hiver nor the Bergamotte de Pentecôte succeeds well when grafted on a Quince stock, and that in many soils the tree languishes, after having blossomed freely, promised greatly, and produced no fruit. To succeed well in the culture of this Pear, it must be grafted on a free stock, and be trained against a well-exposed wall, with plenty of elbow room, that is to say, it must have plenty of space to develop laterally. Under these conditions it will grow luxuriantly, and will give abundance of fruit. As a rule, gable-walls of this aspect are completely wasted instead of being more or less covered with Calebasse d'Eté, Jargonelle, Gratioli, or Bon Chrétien d'Espagne Pears.

Gable-walls facing the west should be used for high-stemmed espaliers of the Poire de Tongres (Durondeau), one of those varieties which, although it grows well in an orchard, increases rapidly in size, depth of colouring, and quantity, when grown on a wall with a western aspect; it becomes, in fact, quite another fruit, both in appearance and flavour.

For gable-walls facing the east, the Beurré Diel succeeds best. It is another example of a Pear-tree which only becomes really prolific when it has plenty of room to develop its branches, the fruit of which, if exposed to the free action of the air, the cold, and the rain, remains small, becomes covered with spots and cracks, the flesh at the same time losing its mellowness and becoming gritty. The Beurré Diel, when grafted on a tall, free stock, will easily cover the whole of a large gable-wall, and yield large, handsome, and well-flavoured fruit.

The north is the worst aspect of all. Good fruit, however, can be cultivated on a gable-wall facing that quarter, provided it be pretty open. The tree must be planted on a mound, and the soil must be made very porous by laying a foundation of rough stones and filling it with soil mixed with sifted lime-rubbish and ashes. The best variety for cultivation in this position is the Beurré d'Amanlis, which will give good results in spite of the unfavourableness of the situation. The Beurré d'Amanlis is the very type of vigorous and beautiful growth. Its long and thick branches grow with perfect freedom, and will spread over a large surface if properly trained and tied or nailed, making a large quantity of wood every year. It is no rare occurrence to be able easily to form as many as three sets of branches in one year, always provided that the stem is sufficiently solid. The Beurré d'Amanlis has this in common with most pendulous varieties, that when the shoots are trained to grow horizontally, or even upright, they fruit much earlier. The Marie Louise, the Nouvelle Fulvie, the Poire de Curé, the Triomphe de Jodoigne, and several others, resemble the Beurré d'Amanlis in this respect. As may be seen, if the Beurré d'Amanlis fruit but slowly when grown in an orchard, no fault can be found with it in this respect when grown against a gable-wall. We give these four varieties as suitable for gable-walls facing the four different quarters with the certainty that they cannot fail to yield the maximum of profit. We cordially admit, however, that there are many other sorts of Pears which will give excellent results when planted against gable-walls, but their selection depends entirely on the tastes and wants of the growers.

The following arrangement will be found excellent:—For a north aspect, Williams' Bon Chrétien, a Pear which is most popular amongst those fruiterers who know it; it will always sell well and profitably. This Pear is sometimes objectionable from giving off too strong an odour of musk, and that in proportion as it is more or less directly exposed to the sun, or the length of time it remains on the tree before arriving at maturity. Planted in a northern aspect there is no need to fear this defect, and the fruit will always be of good quality.

For a western gable-wall the Louise Bonne of Jersey may be chosen. This Pear, which grows easily everywhere, even facing the north, always gives a good supply of fruit when planted as an espalier with a western aspect, and displays all its best qualities, yielding large, highly-coloured fruit, with a surface as smooth as if they had been polished with oil; the flavour is sweet, combined with a certain amount of sharpness, strongly impregnated with the flavour of the Bergamotte. It fruits abundantly and long, and is a healthy, vigorous tree. There is but little to choose between the Marie Louise and the Poire de Tongres.

For an eastern gable-wall the Duchesse d'Angoulême is an excellent variety. This is one of the first Pears that people learn to cultivate, notwithstanding which it is not exactly faultless. In an open orchard exposed to high winds, this Pear never attains its normal size, a characteristic which always gives it an increased value in the market. As a pyramidal or double espalier the blossom is liable to be injured by bad weather, so that this kind often fails to redeem its early promises, the smallest amount of wind causing the fruit to drop off before reaching maturity. The beautiful specimens of the Duchesse d'Angoulême Pear which every one admires so much at our fruit-shows are all grown on espaliers. It is, in fact, only on walls exposed to the proper aspect that a large quantity of such fruit of first-rate quality can be regularly grown. It often happens that many of these Pears, when growing in favourable positions, are obliged to be held up by a cord or supported on a bracket to prevent them from falling off the tree by their own weight.

For gable-walls with a southern aspect the Passe Colmar is admirably adapted, especially when grown as a wide-branching espalier on a free stock. This variety, when grown as small trees, requiring to be grafted on the Quince stock, and to be frequently pruned, is sterile, or at any rate the yield is intermittent and irregular. We know of a specimen of the Passe Colmar, which covers an ordinary-sized gable-wall, and yields annually on an average 400 fine Pears. Estimating these as each worth one penny in the market, we have 33*s.* 6*d.* for the yield of one moderately-sized gable-wall. If a Vine had been planted in the place of the Pear-tree it would possibly have produced a small crop of half-ripe grapes, or, as more frequently occurs, it might have been altogether barren of fruit.

To sum up, if we grow Williams' Bon Chrétien on the north, Louise Bonne of Jersey on the west, Duchesse d'Angoulême on the east, and Passe Colmar on the south, we have a choice of four excellent second-class Pears, which are so good that it may well be asked why they are not placed in the first rank, a state of things which can be only accounted for by the fashion of the day and love of novelty. We may choose other varieties, and allow ourselves a certain amount of latitude to suit local tastes and requirements of the market or the consumer; for instance, a tall-stemmed Beurré d'Hardenpont, grown in a good situation, is not to be despised, and Beurré Sterckmans may be substituted for Beurré Diel. In the same way a Beurré Dumont may very well replace the Poire de Tongres, and the Beurré Hardy, a tree of vigorous habit, and fully deserving its name, may be counted on to yield good fruit, ripening in September when placed against a north wall. The Beurré Hardy closely resembles our old Beurré Gris, one of the varieties which are rapidly passing away. If the grower possess several buildings he may thus cultivate several kinds, but we have thought it necessary to point out to our readers the best sorts for the purpose. In addition to this we shall give a list of all the Pears which can be cultivated with profit against gable-walls of different aspects, in the order of their merit, so that the grower need not fear to be led into the error of cultivating common or mediocre kinds.

Forms of Training.—It will not be necessary to enter into any very detailed description of the best forms of espalier for gable-walls. The most useful form, except in the case of perfectly blank walls, is the tall-stemmed espalier. This will be found to be especially useful in the case of farms and school playgrounds, where low espaliers would only throw unnecessary temptation in the way. If, however, it be found advisable to grow low espaliers, it will be necessary to surround them with a lattice-fence. The extra expense involved in this protection is made up for by the increased yield of fruit, besides which the enclosure may be used for growing early chervil, radishes, small salads, or any plant that will not interfere with the growth of the trees. Another arrangement may be made, in which the lower part of the gable-wall is occupied by two dwarf espaliers, which may differ in kind from each other and from the large espalier, thus obtaining three varieties of fruit from the same gable-wall. It will thus be seen that it is not very difficult to cover our waste gable-walls with fruit-trees, which would not only cover our tables or help to fill our pockets, but which would form admirable ornamental substitutes for ugly, weather-stained, unprofitable blank walls.

By planting two trees, one on each side of the door, it is easy to cover the gable-wall in a way that is at once advantageous and extremely elegant. The tree planted to the right of the door covers the left side of the gable-wall, the tree on the left being trained over the right side of the wall. If there be a garret-window in the gable the two main stems can be trained around it. Low gable-walls, which give but a small amount of angular surface, may be covered by dwarf Palmette Verriers. Buildings with Dutch roofs, or with square walls which are not gabled, and square spaces unpierced with windows or doors, may be filled with Palmette Verriers. We should advise those who commence this system of fruit-culture merely as amateurs to cover the upper part of their gable-walls with tall-stemmed espaliers, and to fill up the space below the lower branches with single or double U-shaped vertical cordons. Cordons trained in this way will yield fruit much earlier, besides the great facility afforded to grow several varieties. The gable-walls of the smallest buildings may be covered by single or double cordons, or else by both kinds grown side by side, the odd numbers being single and the even numbers double, taking care to regraft all their extremities. For very small gable-walls the preference should be given to a half-high-stemmed Pear-tree grafted level with the ground on a Quince stock. It is well known that Beurré Sterckmans, Espéren, Bergamotte, Beurré Diel, Poire de Tongres, Beurré d'Amanlis, and Louise Bonne d'Avranches, when grafted on a Quince stock, are sufficiently strong to form high and half-high stems, and throw out a satisfactory number of prolific fruit-bearing branches. If it be desirable to cultivate kinds which show more or less antipathy to the Quince stock, a good wood-forming variety should be grown half-high, which should again be regrafted with the kind you wish to grow. In case it is necessary to grow two trees against a gable-wall, and it is feared that the trees will be too luxuriant for the small amount of surface to be covered by each tree, varieties on Quince stocks may be introduced with great advantage.

As will be seen from the foregoing remarks, it is always possible to utilize gable-walls for fruit-growing, no matter what may be their aspects, form, or arrangement as to doors and windows. The examples and plans that have been given will enable both amateurs and professionals, with a small amount of ingenuity, to invent combinations that will suit gable-walls of all shapes, whether pierced with one or many windows or doors. A plan to scale of the gable-wall should first of all be drawn on paper, and experiments made until the best method of filling up the vacant spaces is arrived at. When the openings merely serve to light or ventilate a coach-house or some uninhabited room, they should be ignored in the general plan, the trees being trained over them. In planning new buildings it is as well to bear in mind that the gable-walls ought to be covered with fruit-trees, so that the openings may be arranged in the most suitable manner for the trees to have plenty of room to grow without being forced into unnatural shapes. In urging on the grower the importance of giving his trees a pleasing form, we do not mean to say that they must necessarily be rigidly symmetrical. It should not be forgotten, however, that, in order to fill up every vacant space, the branches should be at least 10 in. to 12 in. from one another.

There is another method of covering a gable-wall which is diametrically opposed to those forms already recommended—viz., a double espalier with reversed branches. This system has been adopted by M. Dolivot, a French fruit-grower, who thus describes a gable-wall covered with a couple of trees grown by his method :—" The gable-wall of a small building serving as a bakehouse, and in the middle of which is situated the entrance-door, may be covered by means of a double espalier. Two high-stemmed trees are planted, one on the right, the other on the left of the door. As far as the top of the door the branches are so arranged as to form a sort of curtain, composed of three vertical cordons grafted on to a horizontal cordon at the base. The double rectangular curtain having been formed, the space above the door and reaching up into the gable is formed as follows :—Level with the top of the door a long branch is trained in a horizontal direction about 12 in. above the top of the door, crossing the corresponding branch belonging to the other side in the middle, and reaching nearly to the angle of the gable. These two branches are then laid upwards at a distance of about 12 in. apart until they reach within 2 ft. of the angle of the roof. Starting from this point, the formation of the curtain which is to fill up the two vacant halves of the space on each side is commenced, the vertical cordons being grafted on to the horizontal cordons, which lie level with the top of the door when fully grown. Finally, the two parent branches are grafted together by uniting the top of each shoot. This completes the whole of the work, and the gable-wall will be now completely covered with a gracefully trained espalier, fully repaying the pains and labour bestowed upon it."

M. Dolivot's mode of covering a gable-wall may not be so suitable as several of those which we have already described, inasmuch as it involves more labour in grafting than most amateurs care for, or professionals can afford to give; but it matters little which method be adopted, there will always be full yield of good and handsome fruit. In these remarks we have kept exclusively in view the utilization o wasted gable-walls, but we may remind the reader that all vacant wall spaces, no matter where found, may be fully utilized. The smallest square spaces between windows may be devoted to small subjects, the larger spaces being filled in like manner. A square front with two windows can likewise be covered with a Pear-tree grown according to M. Dolivot's plan of downward training and double grafting. This method of training and grafting fruit-trees may seem difficult or even impossible to those who are unacquainted with M. Dolivot's system; we, therefore, recur once more to this horticulturist's own words:—"According to this system an espalier is planted between two windows in the middle of a pier 4 ft. 6 in. wide, and trained against the side wall of a small house about 20 ft. long. From the branch planted in the middle of the pier, at a height of 1 ft. from the ground, two horizontal cordons are led underneath each window to the right and left, and are intended to serve as correlative cordons. About 3 ft. higher up two lateral shoots are trained horizontally, so as to form on each side of the stem the starting point of a square curtain, composed of seven perpendicular cordons, the lower extremities of which are grafted into the correlative cordon underneath the windows. The central stem rises 1 ft. above the level of the top of the windows, and from this point start three cordons, which descend perpendicularly (one along the central stem itself, and the others, one on each side, 1 ft. from the central stem), and are grafted on to the first horizontal cordon when they are long enough. At the point where these two last-mentioned cordons leave the horizontal direction for the perpendicular, two shoots should be allowed to grow which should be trained horizontally over the windows, and, when long enough, allowed to descend perpendicularly, so as to enclose the windows in a kind of frame. When fully grown, they are grafted into the branch which lies immediately under the windows. About 1 ft. above this last cordon, another and a parallel cordon surrounds it horizontally at first, and then perpendicularly, and when long enough is grafted into both the lower horizontal cordons."

This is not the proper place to discuss the merits of M. Dolivot's system. Whether his will or will not play an important part in the future history of fruit cultivation, can have but little influence on the system of turning unused gable-walls to profit, by whatever method of training the fruit grower may find it advisable to adopt. We again repeat that the object of this system is to cover the vacant space as completely as possible, at the same time taking care to preserve the proper distance between each cordon. Train the cordons as far as they will go, and cut them as little as possible, and you will soon cover your barren walls with masses of rich fruit.

There is another method of covering small and moderate-sized gable-walls by means of superposed espaliers. The expression is, perhaps, hardly a correct one, but it must be used, for no other so fully explains the idea and the object to be gained. It may happen that the gable-wall is so high that it cannot be completely and rapidly covered by one espalier only. In this and similar cases, the tree being trained in the Palmette Verrier form, the head is grafted, and the branches of the graft are trained horizontally, or nearly so. The graft should be of some variety that is somewhat wanting in vigour, but displaying great fruit-yielding qualities. The tree can be formed of two varieties, one growing over the other upon the same stock. The lower portion should be of a strong, robust description, such as Beurré Diel, Beurré Rance, Triomphe de Jodoigne, Beurré Sterckmans, Conseiller de la Cour; the upper should consist of a prolific kind, showing but an ordinary amount of vigour, such as Beurré Clairgeau, Louise Bonne d'Avranches, and Williams' Bon Chrétien. The form of the upper espalier should, of course, be suitable for the method of training. A wall of this description should be completely covered with a single tree formed of the two varieties, one of which is of vigorous habit, spreading over the square portion of the gable-wall; the other, of weaker habit, with horizontally trained branches filling up the angle of the gable.

We do not wish to stray from our subject, which we have already treated at some length, but we think that a new system of fruit culture, which will be to some extent a corollary to the plan of utilizing waste gable-walls, may find its proper place in this *treatise*; we allude to the tall-stemmed double espalier. In the country it is frequently customary to place near the dwelling-house, especially where the front is exposed to the full rays of the sun during the greater part of the day, a screen of high-stemmed trees to keep the sunlight from playing too strongly on the house-front. Various trees are used for this purpose, such as the Lime, the Elm, the Robinia, and many others, and nurserymen grow large quantities of these trees with tall stems for the especial purpose; but the same object may be attained by growing fruit-trees on the same plan, that is to say, with tall stems, and training them in the shape of a fan. The branches should be slightly oblique and trained against a number of galvanized iron wires stretched between posts, which will sustain the young trees during the first few years of their growth. We have seen the idea fully carried out in practice, and we have no hesitation in declaring that this mode of cultivation is most successful. The fruit trees which are best suited for this method of culture are strong Pear trees, Apple trees, and Bigarreau Cherry trees grafted on stout stocks. It would, indeed, be a pleasant sight to see our villas and cottages shaded with prolific fruit-trees instead of Limes, Elms, or Robinias generally clipped into hideous forms. But the cultivation of fruit-trees on the double espalier system should not end here. It may be applied in the case of low walls, over which indiscreet neighbours are in the habit of peering. The space above the wall costs nothing, the only expense being that of the posts and wires. The author may have apparently given too much attention to the Pear tree, inasmuch as there are many other fruit-trees which are as easily and as profitably grown against waste gable-walls. In most cases, however, the preference must be given to the Pear, for not only is its cultivation extremely easy, but its fruit always commands a ready sale everywhere. It is, besides, one of the hardiest of our fruit trees, and suffers less from bad weather than any other. Let us, however, examine the best means of cultivating other fruit-trees against our waste gable ends.

THE PEACH, APRICOT, AND CHERRY.

A strong Peach seedling, or Peach grafted on a tall-stemmed Plum stock, may be grown against the south gable-wall, and will yield a good supply of fruit, always provided that the late frosts have not made havoc with the delicate young blossoms. The Péche d'Oignies, on a free stock, is a favourite sort for this mode of culture, and we have seen a large gable-wall wholly covered with a Brugnon de Feligny Seedling, and producing large quantities of beautiful fruit. A tall-stemmed Espalier Apricot, when it is not grafted on a Myrobalan but on a strong Plum seedling, succeeds well when grown against a south-east or even an east gable-wall, provided it be trained in the shape of a fan. At the Pomological Congress, lately held at Ghent, M. Baltet specially called attention to this method of growing Apricots on tall stems. The Apricot has the advantage of preferring paved or macadamized yards to the open ground. Planted in such situations its existence becomes prolonged. M. Delaville, professor of arboriculture at Beauvais, Oise, has justly called the Apricot the "city fruit tree." Grown against a gable-wall, the lower branches must be allowed to grow vigorously, and it must be trained to a fan-shape, or somewhat in the form of a Peacock's tail, but always on a tall stock. The Griotte Cherry is never so prolific as when grown on a tall stock. It may be grown against shaded walls, and will still yield abundance of fruit. The same *may* be said of the Cerise de Charmeux and the

Belle de Chatenay. It is very possible that seeing the luxuriant growth of espaliers when trained against gable-walls, we might be able to grow the finest varieties of the Bigarreau Cherry, especially those kinds which do not succeed when their growth is impeded.

THE APPLE.

We are so much accustomed to disdain the cultivation of the Apple anywhere but in an orchard, that (as yet there have been but few experiments made in this direction) it is impossible to assert positively whether we may or may not count on obtaining good results from long-stocked trees grown against a west or north wall. Varieties which do not thrive in an open orchard, such as the White Calville, the Reinette Blanche, the Reinette Grise, the Haute Bonté, and similar first-class kinds, ought to have every chance of succeeding when grown against gable-walls. M. Charles Baltet (the greatest authority, perhaps, on the subject) declares that this mode of cultivation ought to meet with every success if the variety be grown on the Paradise stock instead of on the free stock. In any case it is beyond all doubt that we shall have to keep down the American blight more than when other methods of cultivation are adopted. M. le Chevalier de Biseau d'Hautteville, the eminent pomologist, of Binche, whose authority is incontestable, communicates the following particulars on the subject, quoting from an article on "Waste Gable-walls," published in the *Bulletin d'Arboriculture*, for 1876, p. 14:—
"I agree with M. F. Burnevich in considering that the cultivation of the Apple outside the orchard is too much neglected, or, to speak roundly, neglected altogether. As far as my experience goes in growing the above-mentioned varieties on walls, exposed to the west, I have great pleasure in informing you

that I have met with the greatest success. At this moment I have a long terrace situated on the ancient fortifications of Binche, about 70 ft. above the ground, and facing the west, upon which is growing an espalier of the white Calville variety, the upper portion of which is trained along the top of the wall for a distance of 12 ft. or 15 ft. The tree is nearly forty years old, and is grafted on a free stock. It produces magnificent fruit of a pale yellow colour, nearly always tinged with carmine on the side next the sun. They have a delicious flavour, and keep well from July to September. On the same wall there is another variety growing called the Unique, but it receives only a couple of hours of sunshine. I also get excellent results from this young tree, which is grafted on a Paradise stock. At the foot of this terrace is the garden of two great fruit growers—MM. Eric and Emile Grégoire. In this garden is planted a Canada Reinette, twenty years old; it is on a tall stock, and is trained against a north-west wall, where it receives but little sun. The soil is damp and cold, but it bears an abundance of fruit of enormous size, and is so beautiful that passers-by stop to admire the hanging clusters. I would add that I have also the Grey Canada Reinette, Warner's King, the Queen Pippin, the large flat Reinette, both on half-tall and tall stocks, in situations where they do not receive an hour's sun during the whole day, besides which the wall is shaded by tall Cherry trees, and at about a couple of yards opposite to them there is a hedge of Raspberry canes. These drawbacks do not prevent our gathering an abundance of fine fruit. I hope shortly to be in a condition to state whether the White Calville will succeed under such unfavourable conditions, for I have already planted several trees against this same wall which are now two years old. I cannot conclude this without urging on my col-leagues the advisability of increasing the cultivation of the Apple by making a fresh choice amongst the numerous and rich collections to be found in the nurseries of our principal horticulturists, for this tree is of easy culture, yields abundance of fruit, more varied in form, colour, and flavour even than the Pear, besides keeping longer and with less attention. I will not speak here of all the varieties which may be cultivated, and whose good qualities are known to all fruit growers. It is sufficient to mention the following:—Royal English Reinette, St. Sauveur Calville, Grand Alexandre, Parmentier Reinette. The following may be also mentioned as large-fruited late varieties:—Rosée du Matin, Wagener, St. Barbe, Tauben Apfel, Golden Noble, Reinette Diel, Belmont, White Calville, Unique, Lelieur, Meriam, Duchesse de Brabant, Pomme de Prince, Guelton, Lorenzo Rooth. The following are handsome small varieties: Api rose, Api noir, Pigeon blanc de manger, Pigeon Lucas, Pigeon d'Oberdieck, Sops of Wine, Petite Emma, Pretiosa.

We do not entirely recommend the cultivation of the Vine against gable-walls, except when the fan shape is abandoned in favour of single or compound vertical cordons, according to the Thomèry system. At the Château d'Oosterzeele, not far from Ghent, there are several large gable-walls facing the south and covered with black Mulberry trees, which produce abundance of fruit, although shaded by high copses which are close by. The cultivation of the Plum is not recommended for gable-walls.

SPECIAL TREATMENT OF FRUIT-TREES ON GABLE-WALLS.

We have no need to enter into any explanations with regard to the pruning and other operations to be performed on trees grown on gable-walls, because they are the same as those practised on trees grown in other situations. Long-stemmed espaliers should have their stocks lime-whited every two years, and the first year they may be even covered up with straw. In situations where they are liable to be gnawed by cattle, the stems should be covered with a couple of boards nailed together in the form of a V, or by fixing two slips of wood covered with sharp nails on each side of the stock. Situations not overshadowed by neighbouring trees should, as much as possible, be chosen, but where shadow is unavoidable, those varieties must be chosen which do not require much sunshine. Under such circumstances a south gable-wall may be planted with trees which thrive well in a northern or western aspect. The best way of attaching the branches to the walls is by slips of cloth. The branches, too, should be kept from touching the wall by interposing pieces of cork or wood; this precaution is absolutely necessary in cases where the branches lie against a wall which is strongly heated by flues or fireplaces. As for pruning, it is the same as for other trees, but as the upper portions of the branches are difficult to get at, it will be as well to make use of the *sécateur*. On account of the difficulties involved in the care of the Vine and Peach during the summer, and the great trouble in training, they are not to be recommended for cultivation against gable-walls. The special and constant pains which the Vine and Peach require need not, however, preclude them entirely from this mode of cultivation by amateurs who have both time and patience at their disposal.

Seedling Fruits.—Raising seedling fruits requires no skill or previous knowledge. A boy or girl can sow the pips of Apple or Pear, or the seeds of any other fruit-tree in pots of soil, and afterwards plant the young trees in the garden, they will take up but little space for several years, and when they bear, if found unworthy, they can be grafted with some approved kind, and even if we fail in raising a superior variety no loss will be incurred, and disappointment should lead to increased exertions, as, according to the system of averages, one has only to persevere long enough to succeed. The work is intensely interesting, and the hope deferred which maketh the heart sick does not enter here. Even the uncertainty attending it is a source of interest, for the raiser of seedling-fruits is living in a pleasant state of expectation. Many of our best Apples and Pears have been raised by cottagers and amateurs, and there are still many kinds possessing considerable merit which are only known locally. The benefits I am expecting to arise from more attention being given to raising seedling fruits are of a twofold nature. First, the raiser will be benefited, for even if he fails to raise even better than existing kinds, yet he will surround himself with many trees that will produce much fruit, and he will discover that some will possess in a marked degree the power of adapting themselves to local conditions as regards climate and soil. Our climate is so variable it is almost impossible to say what will or will not succeed in any given locality. I am perfectly convinced if there were a few hundreds of enthusiasts scattered over the country devoting themselves to the raising of seedling fruit, it would not only benefit the individuals themselves, but the nation also would reap much advantage ultimately. I know several men in humble circumstances who have their gardens full of seedling Apples, Pears, Plums, and Cherries. And they always have abundance of fruit. And a visit to them is always interesting, but especially is this so when the fruit is approaching maturity. If possible, a pedigree book should be kept of the origin of different trees. On the side of the female parent this might in most cases be done. Any tree which bore inferior fruit would be cut down after it had been fairly tested and grafted with a good kind. There is no finality in the matter of raising fruit, for though we possess many excellent varieties already, yet I doubt not if the matter is taken up earnestly something useful will grow out of it. Nearly all our existing fruits have been raised in a chance kind of way without any system, and there are difficulties in the crossing of two suitable kinds of Apples and Pears in keeping away foreign pollen, though if a collection of fruit suitable for carrying out experiments were grown under glass in a cool house, or one slightly heated, insects and air-currents might be kept out, or their effects neutralized. In this way fruit raising might be reduced to a science, and an impetus of considerable value be given to fruit culture.

The Mulberry.—Though never likely to be planted on a large scale, yet the Mulberry is deserving of a place in every garden, both for its delicious fruit and also for its picturesque appearance. The Mulberry tree sometimes suffers from the severity of our winters, and should occupy a sheltered situation in the shrubbery or on the lawn. It does not bear freely until it has acquired some age and size, but to compensate for the backwardness in youth, it has a fruitful old age, often living for more than a century, and bearing freely to the last. It grows freely in any good soil, and is easily propagated by *cuttings* and layers.

PROFITABLE FRUIT CULTURE.
THE SOUTH.

Although not what may be strictly termed a market grower, I have had good experience in fruit growing districts, and number among my personal friends several practical men who not only are successful fruit growers, but who are particularly good judges of what kinds and varieties are most profitable.

Competition, it appears, owing mainly to the extensive imports, is now very keen, and it is not entirely a question, when selecting, as to which varieties are most prolific, but which sell the most readily. With this end in view, the intending grower at the outset should frequently visit the markets and ascertain, as far as practicable, what is most in demand at the different seasons, the best methods of sending, and other serviceable details. The friendship of a salesman is especially valuable, not only then, but later on when the orchards are in full bearing, as these men know better than anyone what should be grown, how to send the produce, and when best to push the sales. It will be found that there are three very important agencies in connection with the success of a fruit grower, and which should not be lost sight of by beginners—viz., suitable soil, favourable position, and convenient locality of the orchard.

Soil.—Not a little depends upon the natural soil of the intended site. A shallow surface soil, with perhaps a gravelly subsoil, is altogether unsuitable, as the majority of fruits that ought to be grown succeed only on a comparatively strong and deep soil. To double dig this, however, on a large scale is almost out of the question; but a well-horsed sub-soiler will do much to break up and eventually improve the hitherto unbroken subsoil. If naturally retentive of moisture and imperfectly drained, then by all means resort to artificial draining; but rapid shallow draining must be guarded against, or this may prove nearly as injurious as stagnation. As a rule, the subsoil only requires draining, and this both deeply—say about 4 ft.—and at wide intervals—say about 20 ft., or midway between each row of trees. This, with good outlets, will ensure the requisite slow, but certain, percolation of the surface water through the whole depth. With regard to a

Favourable position, as a rule I should prefer to plant an orchard on a gentle declivity, with a S.S.W. inclination, and would provide a belt of Spruce or other Firs to afford further shelter from easterly winds, which so frequently greatly injure our orchards. If a comparatively light soil prevails, then I should prefer a level, but not low-lying position for an orchard, avoiding land in proximity to a stream, which inevitably contributes to, if not the sole cause of, late spring frosts. We not only are anxious to secure a good "blowth," as an abundance of bloom is suggestively termed by the natives of some of the western counties, but like to avoid the great anxiety prevailing in low-lying districts till a good set is secured. More than is at first apparent depends upon commencing fruit growing for profit in a

Favourable locality, and this, to deserve the designation, should be in the neighbourhood of a large provincial town, or within comparatively easy distance of London. After a fair experience in more northern districts, I can safely assert that better crops on an average can be secured in the more favoured southern counties, and there is a greater certainty of effecting better sales in London than elsewhere, not excepting even such important towns as Manchester, Liverpool, Leeds, Nottingham, &c.

Kent, Surrey, Sussex, Essex, Herts, are all available for the production of, and each does contribute largely to, the requisite supplies of fruit. The south-western counties are all highly favourable for fruit culture, but the bulk of the produce must be sent to a great distance to secure profitable prices, the demand in such towns as Bristol, Bath, Southampton, Portsmouth, &c., apparently not being extensive. At times fruiterers in these important towns can give good prices for a moderate quantity of fruit, and it may be best to let them have it. As a matter of fact, however, many provincial fruiterers are in close business relations with London market salesmen, and from them procure the bulk of their choicest fruits. At times the fruiterers find it necessary to send much surplus fruit to the salesmen, and this does not improve the "returns" of the growers. Another advantage attending the proximity of an orchard to a large town is the certainty of being better served by the railway companies, and in this case the produce will be delivered quickly and well.

What should be grown.—There are certain kinds of fruits that invariably prove profitable, and which may safely be planted in large quantities. Of these, the most in demand are Damsons, kitchen and preserving Plums, kitchen Apples, black and red Currants, Gooseberries, Strawberries, and Morello Cherries. As will be seen, nearly the whole of the foregoing are applied to two or more purposes, being either fitted for dessert, making into jam, or for cooking. Damsons are also largely employed in the production of a dye, while Plums are frequently bought up wholesale for various purposes. Kitchen Apples, notably the early sorts, sometimes sell very readily; besides they are available before the heavy foreign supplies reach our shores. Black and Red Currants are extremely popular fruits, and I am informed on good authority that the former are largely exported; added to this, they seldom fail to bear well. Gooseberries give two chances, being oftentimes very profitable when sold in a green state; besides this, insures the thinning of heavy crops, and thereby greatly affects the quality of those left to ripen. Strawberries are an expensive, but at the same time remunerative crop, as when sent in good condition they find a ready sale (at least such is my experience in the metropolitan markets, to which I ought perhaps to state my remarks have especial reference). Standard trees of Morellos, when planted in the middle of an orchard, seldom fail to bear heavily, and a remarkably pretty sight they present. Dessert Cherries occasionally prove extremely profitable, but are a glorious uncertainty, nevertheless.

Apples generally, Pears, Filberts, and Raspberries, each in their turn, may prove profitable, and may well be grown in limited quantities, the aim being to have as many chances as possible. At times, though seldom of late years, there is a glut of Apples in the market, many sending in large quantities to avoid storing, and in this case probably the "returns" are *nil.* If properly stored, and this is no easy matter, the American and Canadian supplies spoil the markets, and, strange to say, our Transatlantic brethren better understand what sorts are the best adapted to the work and prove most saleable. Neither do they risk failure by sending inferior or mixed samples. All their fruit are even in size, bright in colour, and, in addition, whether rightly so or not, are considered adapted to either culinary or dessert purposes. Here lies the secret of their undoubted success in finding good markets, and their tactics should be imitated by would-be successful fruit growers in this country. That is to say, a few only really good sorts should be grown, but the bulk of the trees should be of varieties adapted for either purpose, and if highly coloured so much the better. When sending, keep the very small fruits back, or, at any rate, in separate sieves, as they tend to spoil the samples, and hinder the sale accordingly. Pears are not to be depended upon, but a few rows may occasionally prove profitable, none more so than " Williams," as the costers and others sensibly abbreviate Williams' Bon Chrétien. Raspberries seldom fail to crop heavily, but they travel badly, and, as a rule, have to be sold locally.

Filberts and Cobs only succeed in rich, loamy soils, such, for instance, as will grow good hops. In Kent they are particularly well managed, and in a good season more than compensate for the labour bestowed upon the orchard. They are either disposed between the widely-planted rows of Apple-trees or are alternated with the Apples. They are not allowed to grow at random after the manner of the Hazel in hedgerows, but are trained similarly to Red Currant bushes, only much taller, or, as some prefer, similar to a dwarf Apple-tree, with a clear centre, and are as closely pruned, with the exception of retaining a quantity of spray-bearing catkins to provide pollen for the proper fertilization of the apparently insignificant, but most important, fertile flowers.

A good arrangement, of which I for years have had an insight into, might well be adopted by others. The orchard comprises all the kinds of fruit I have mentioned, with the exception of Strawberries, these after the first seven years being grown quite clear of all other crops. All the Apples, Pears, Plums, and Cherries are grown as standards, the lines, as a rule, being formed with one sort, running through a length of about 20 ft. apart, the trees in the lines being the same distance asunder. All the available space between the trees each way is rather thickly planted with Gooseberries, Currants, Raspberries, and Filberts—large breadths, each containing several thousand plants, being thus worked in. When the standard trees had grown considerably, and the bushes become crowded, half of the latter were removed and planted in a new orchard. On the same farm numbers of Damson trees were planted almost in the hedgerows and are doing well; and if a new hedge should be required (and they are sometimes serviceable in preserving a path or restricting a right of road), these are formed of either Gooseberries or Currants. Every foot of ground is thus utilized, and should be in every case. Many of the trees I have seen planted, or have assisted to plant, were "miserable scrags," and these are preferred to vigorous and more attractive looking trees. Being probably grown on a poor soil, the change, instead of being injurious, proves highly beneficial, and the trees soon get established, and grow freely. It is advisable to stop the lower branches, but as they materially assist to swell the stems, they should on no account be removed until this is accomplished. Trees infested with

American blight should by no means be planted, as this pest is not easily eradicated, and if allowed to spread quickly ruins an orchard. Experienced men are always anxious to procure trees true to name, but are doubly solicitous with regard to the possibility of having American blight sent to them. They would destroy these infested trees rather than plant them. In planting, unless the young cultivator has secured the services of a trustworthy and experienced foreman, no dependence whatever should be placed upon untried workmen. If left to the latter, the chances are the trees and bushes will be both mixed and badly planted. A spit taken *out with* a spade, the roots of a bush thrust in, and the soil returned without breaking, and trodden in, will not answer in an orchard, if it does sometimes for nurserymen. A good-sized hole should be dug, the bottom made firm, and on this the roots, previously trimmed where bruised or unequal, may be evenly disposed, and surrounded with well broken-up soil. Deep planting, although it saves stakes (I know of no other reason why people should plant deeply), is simply ruinous. If the soil be poor, it should be enriched at the commencement, and all well-established trees and bushes on any soil well repay for annual and biennial top-dressings with fresh manure. Very seldom do market growers resort to root-pruning. This is rendered unnecessary by simply withholding the knife after the trees are once framed out. Let alone, they soon fruit abundantly, and all that is necessary is to occasionally shorten back straggling shoots and to thin out where crowded. The bushes are annually pruned.

A selection of varieties that have been found profitable in a southern county is as follows: Of Apples—Keswick Codlin, Manks Codlin, Lord Suffield, Red Quarrenden, King of the Pippins, Duchess of Oldenburgh, Hawthornden, Cellini, Cox's Orange Pippin, Blenheim Orange, Warner's King, Reinette du Canada, Fearn's Pippin, Jolly Beggar, Stirling Castle, and Sturmer Pippin. Pears—Williams' Bon Chrétien, Louise Bonne of Jersey, Duchesse d'Angoulême, Crassane, Beurré Diel, Hacon's Incomparable, Hazel, Beurré d'Aremberg, and Beurré Rance. Plums—Early Rivers, Victoria, Orleans, Green Gage, Coe's Golden Drop, Pond's Seedling, Washington, and Mitchelson's. Cherries—May Duke, Bigarreau, Black Tartarian, Elton, Red Jacket, Kentish, and Morello. Gooseberries—Whitesmith, Early Sulphur, Crown Bob, Red Warrington, Golden Drop, and Lancashire Lad. Of Red Currants—Raby Castle and Red Dutch;

White Currants—White Dutch; and of Black Currants—Lee's Prolific and Black Naples are preferred. Strawberries—Alice Maud, Vicomtesse Héricart de Thury, President, Sir J. Paxton, Dr. Hogg, British Queen, and Eleanor are all largely grown for the markets, though, as a rule, the growers depend upon three varieties and which form a good succession. I ought not to omit mentioning that the Damson largely planted by those in the secret is the Cluster or Crittenden Prolific.

THE END.

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